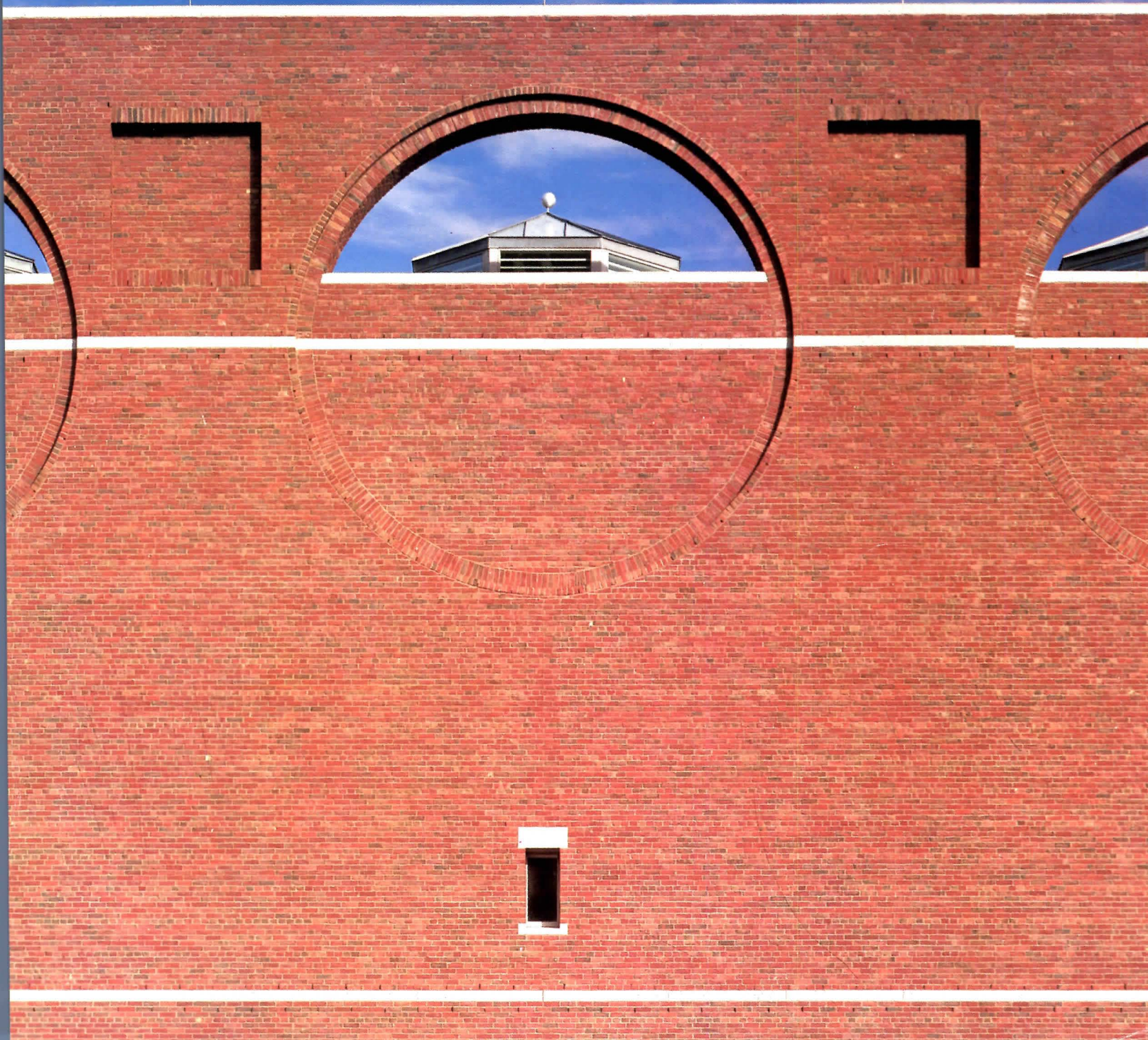


# ARCHITECTURAL RECORD

Business Design Engineering  
A McGraw-Hill Publication, Six Dollars a Copy  
November 1983





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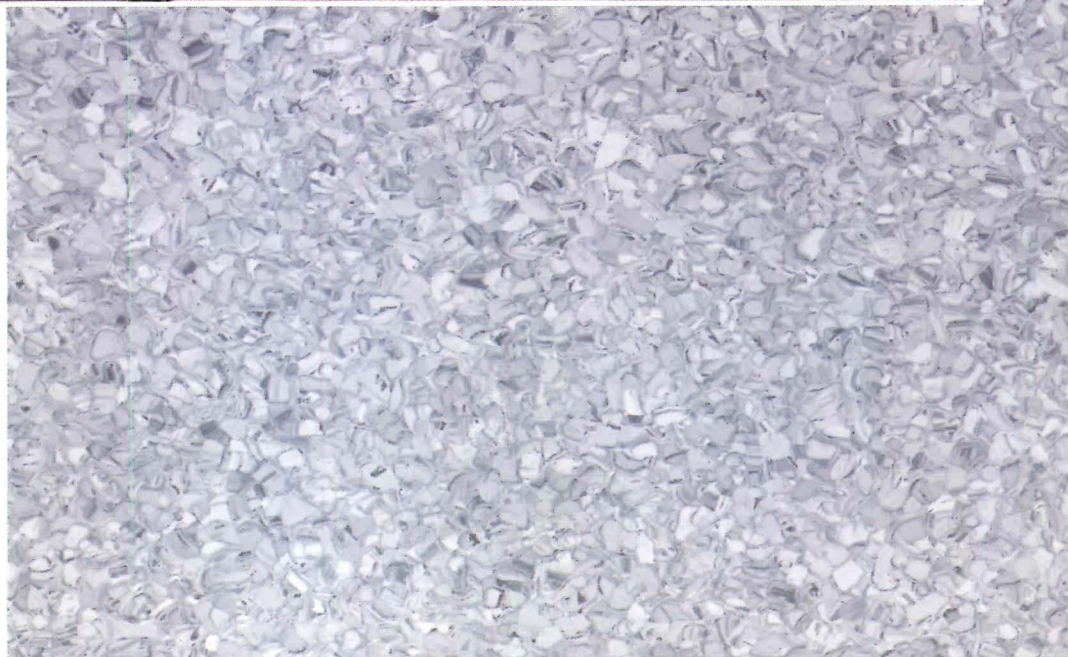
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I have just today seen a reprint from June's ARCHITECTURAL RECORD and write to tell you how impressed I am with it. It goes without saying that it is beautifully done, and visually presents our institution in ways that are a delight to the eye and, of course, satisfying to behold.

But my greatest pleasure comes from your comments. You have caught exceptionally well the value of the institution vested in the people who are here as staff, as students and as patients, and eloquently related the importance of the buildings to that concept. It is an impressive statement and one I am proud to acknowledge as an accurate statement of us.

Roy W. Menninger, M.D.

President

The Menninger Foundation  
Topeka

Your recent recognition of the unique and very beautiful Billerica, Massachusetts Public Library (RECORD, August, 1983) had a glaring omission which we feel should be corrected. While great credit was given to the architect, the person most responsible for Billerica being enabled to even hire an architect was never mentioned.

We are referring to Helen Potter, supervisor of the local public schools' Art Department, who spent 12 years and more hours and effort obtaining the EDA grant and raising other funding for our new library than it is possible to measure. We find this omission particularly offensive since the EDA funding was granted with specific conditions that minorities be duly represented on the Billerica Library Committee of which Helen Potter was chairperson.

We feel strongly that the esthetic qualities of the building that you chose to display in photographs and describe in your article reflect the expertise of the chairperson to a very high degree. Your failure to mention any of these facts raises the question in our minds as to how closely you are in concert with the EDA philosophically in regard to their demands for minority representation. One cannot but wonder if Helen's name would have been omitted if she were a man. The letter to the Editor in that same issue expressing similar regret that the names of two other women were omitted in a previous article only serves to lend credence to the validity of the question raised.

We feel it would be very much in order for an article to be

written about the work done by this unusually dedicated woman to make the work done by James C. Hopkins, Inc., the architect, and Crissman and Solomon, consulting architects, possible. We further feel that you will find it easy in our town of approximately 40,000 people to get the story of "the woman behind the architect," for it is well known to our citizens. We'd like to see it written, for it is undoubtedly a story repeated in towns and cities all over the country and seldom, if ever, told! Thank you for your consideration of our request and any information that might serve to answer the questions in our minds about your commitment to giving equal credit to women and minorities of all kinds.

Jean Coppinger, Sue Cook and  
Sue Bannister, Concerned  
Citizens  
Billerica, Massachusetts

*So many people whose contributions are important are involved in the buildings we publish that we cannot list them all. We hope that by running your letter Helen Potter will receive the recognition she deserves. — Ed.*

**Corrections**

Please note the following error on page 58 of your August 1983 issue. The Architect of Record for the Columbus Trade and Convention Center was Pound, Flowers and Dedwylder, Architects, not Arthur Cotton Moore as noted. Mr. Moore was employed by the Architect of Record as a design consultant. *Murphey Pound  
Pound & Flowers Architects  
Columbus, Georgia*

In ARCHITECTURAL RECORD's story on the Brooklyn Bridge restoration/remodeling (August 1983, pages 124-127), Richard A. Daley, formerly with the firm Smotrich & Platt, should have received credit as project architect. Mr. Daley is presently with the New York City firm of Shelly Kroop Architects.

In our coverage of works in progress by Cesar Pelli [ARCHITECTURAL RECORD, July, 1983, pages 104-113] Paul Kivett should have received credit for the photograph of the Indiana Tower model on page 106, and Kevin Hart should have received credit for the perspective drawing of Pin Oak commercial center on page 109 and also the photograph at the bottom right.

**November 1 to January 2**

"The Art of the European Goldsmith: Silver from the Schroder Collection," a traveling exhibition organized by The American Federation of Arts, includes nearly 80 silver and gilded-silver objects dating back to the 1870s; at the Cooper-Hewitt Museum, 2 East 91st St., New York City. For information, contact: Sandra Gilbert, AFA (212/988-7700).

**November 18-19**

"Super Insulation for the Mid-Atlantic Region," a conference and exhibit, addresses the appropriate use of high levels of roof, wall, below-grade and window insulation. Co-sponsored by Mid-Atlantic Solar Energy Assn. and Philadelphia Electric Co.; at the Sheraton Hotel, Valley Forge, Pa. For information: Irisita Azary, 2233 Gray's Ferry Ave., Philadelphia, Pa. 19146 (215/545-2150).

**November 30 to December 2**

Sixth World Energy Engineering Congress exposition features equipment to improve energy efficiency for industrial, commercial, institutional and utility facilities. Sponsored by the Association of Energy Engineers; at the Georgia World Congress Center, Atlanta. For information: Albert Thumann, executive director of Association of Energy Engineers (404/447-5083).

**December 6 to January 29**

"In Pursuit of Perfection: The Art of J.-A.-D. Ingres" presents nearly 80 works, including paintings, drawings, watercolors and portraits. At the J. B. Speed Art Museum, 2035 S. Third St., Louisville, Ky. 40208. For further information, contact: Dr. Kelly Scott Reed, director of public information, at the museum (502/636-2893).

**December 8-11**

"Successful Rehabilitation," a series of workshops sponsored by the National Trust for Historic Preservation, the Association for Preservation Technology and the National Park Service; in New Orleans on December 8-11, in San Francisco January 19-22, and in Savannah February 23-26. For information: write to The Center for Preservation Training, "Successful Rehabilitation," National Trust for Historic Preservation, 1785 Massachusetts Ave., N.W., Washington, D.C. 20036 (202 673-4092).

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# On talking to the public about architecture

Just two years ago, in an editorial arguing that we should take every possible opportunity to talk to the public about architecture—to argue the case for good design and explain what it is that architects do—I suggested that “the opening of a good local building seems enough of an occasion for me. In Westport, Connecticut, where I live, the nationally known firm of Gwathmey Siegel is in the midst of developing a design for a new public library. Most of the local architects—and there are some good ones—wanted the commission; but I think nonetheless they might organize together some kind of gala evening to let Charles Gwathmey and Bob Siegel talk about their plans and thinking.”

Last month, that very meeting took place. The chief organizer and driving force behind the meeting was the library director, Joan Turner; and it was sponsored by the library board, the Friends of the Library, the local Arts Council, and the Connecticut Architecture Foundation, a tax-exempt organization whose “primary purpose is to increase the public’s understanding of architecture and how it is practiced.”

I wouldn’t call the event a “gala,” as I suggested in that editorial two years ago. It turned out instead (which is better and more appropriate) to be a very serious discussion of a building that is going to be very important to the town. As Gwathmey said (and this I think is a critically important idea to an audience of townspeople), there are many more issues than just a building. Before even discussing the new library in question, he made a slide presentation of two other buildings under design in the Gwathmey Siegel office to explain the concepts of defining space, the context of a site, the relevance of historical allusions, and how the shaping and massing of a building evolves. He then described the proposed library in all of those terms—including an explanation of how a community that long since gave up its town green would have a new one created by framing a long-underused lawn along the river with the new building.

It was a gutsy thing for Charles Gwathmey and Bob Siegel to do. For one thing this was not an official public meeting, or even one of the innumerable hearings to which any architect (or builder, or client) is for better or worse subjected in a New England town. Professionals who work in a New England town are routinely confronted with a planning and zoning commission, a zoning board of appeals, a finance committee, a conservation commission charged with minimizing impact on wetlands and/or coastlines, often an architectural review board, not to mention a town engineer, a public works department, and a board of selectmen. The point is that Gwathmey and Siegel took on this meeting in the cause of talking to the public about architecture—at a time when the building is still in working drawings and before financing (which will combine public spending with privately raised funds) is assured. It was, I repeat, a gutsy thing to do.

There were, of course, criticisms of the design; as there are bound to be criticisms of any design. Some of the architects who came (I figured there were about 35 there) “hated it,” some thought it didn’t seem “Gwathmey Siegel-ish enough” and some admitted “it’s a very nice piece of architecture.”

Significantly, there were relatively few questions asked during the meeting in the auditorium; though both Charles and Bob were “grilled” (mostly in friendly fashion) during the wine-and-cheese reception that followed. It was clear that the audience of well over 200 townspeople truly cared about the site and wanted to understand this important new piece of architecture. Which is, after all, what the meeting was for. Three cheers to the architects for letting themselves in for this “optional extra” questioning and debate. Three cheers for the people who came out on a Tuesday night to listen. And three cheers for the local architects who came (some of them from an hour away) to study the work of an honored firm who to many was “the SOB from out of town who got the job.” *W.W.*



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## More favorable news on Davis-Bacon

In a move that upheld most of the Labor Department's plans to revise the Davis-Bacon Act with the goal of reducing government construction costs, the U.S. Appeals Court in Washington denied a request this fall by the AFL-CIO Building and Construction Trades Department for an *en banc* rehearing of an earlier supportive ruling.

Robert A. Georgine, head of the AFL-CIO Building and Construction Trades Department, said the union will now petition the appeals court for a stay of the order and will ask the Supreme Court for a *writ of certiorari*—the initial step in going before the Court.

The appeals court last July overturned a decision by a lower court that had halted the Department of Labor's plans for streamlining Davis-Bacon, the act that determines prevailing wages on Federal construction projects. The rules, issued last May, would bring the administration of prevailing wage law in line with private industry practice, and would have saved the government some \$600 million in construction costs annually, Labor Secretary Raymond J. Donovan claimed.

In its July review, the appeals court rejected simplified filing of the weekly payroll by contractors and expanded use of helpers on Federally funded projects as "contrary to statutory language and purpose."

However, the court approved a shift from the so-called 30-percent rule in determining prevailing wages in an area to a weighted average when there is no single wage prevailing for a majority of workers. It also approved the department's exclusion of urban prevailing-wage data for rural areas, permitted the exclusion of wage data from Federal projects in the prevailing-wage determination process, and supported the expanded classification and use of helpers on Federal projects in those areas where the practice is "prevailing" rather than merely "identifiable," as the department had wanted.

The latest appeals court denial of the motion to rehear Davis-Bacon was hailed by the president of the Associated Builders and Contractors, Edward Frohling, as "a strong victory for cost effectiveness in Federal construction." The proposed changes, said Frohling, "will finally return the competitive edge the Federal construction program so badly needs." *Peter Hoffmann, World News, Washington, D.C.*

## Setback for preservation tax incentives

The administration is trying to do by regulation what Congress would not do by legislation, according to one AIA source who notes that several bills to similar effect have been rejected by Congress in the past three years. The regulations, which were drafted by the Department of the Interior and approved by the Office of Management, should be finalized this month.

First, persons seeking certification of their buildings as having historic merit and thereby being eligible for the maximum 25-per-cent credit would have to pay user fees to the Department of the Interior. User fees include a basic \$250 for each application for review. Fees for review of the project when completed range from \$500 for projects worth between \$20,000 and \$99,999 to \$2,500 for projects of \$1 million or more. The net effect, according to the AIA source, will be to reduce the economic benefits that the exceptions were supposed to create. This would lessen the incentive to go after the full 25-per-cent credit with its careful and worthwhile controls on new construction's compatibility with the existing.

Spokespersons for "Preservation Action," a nonprofit advocacy and lobbying group, say the user-fee concept is "a sham." It is not authorized by law and will not be used to advance the preservation cause within the Interior Department. Instead, revenues will flow into the U.S. Treasury. The group says that even field offices of Interior's National Park Service oppose the concept because of the added bureaucratic burden and the expectation that the extra

work will eat up the revenues generated by the fees.

The new regulations would also make voluntary each state's previously mandatory maintenance of historic preservation officers, who were the initial clearing and expediting personnel in the application process. The Preservation Action spokespeople feel this will greatly reduce the chances for success of applications for National Register listings in those states that abandon their programs.

AIA president Robert Broshar wrote in a letter to Jerry L. Rogers, Associate Director of Cultural Resources of the National Park Service, that the institute feels state preservation programs "should not be viewed as simply another government program to be cut, modified or reformed for the sake of change." Broshar said the Interior Department should reject the "voluntarization" concept, should support state preservation officers, and should channel any user fees to the Historic Preservation Fund. As drafted, the regulations "would be counterproductive to preservation efforts nationwide."

The regulations come at a time when AIA efforts to make the use of the 25-per-cent exemption more attractive are just beginning to bear fruit. Among the first results are a current Senate bill to reduce the length of exterior walls that must be maintained from 75 to 50 per cent so that the program would be applicable to a broader range of owners. *C.K.H. and Peter Hoffmann, World News, Washington, D.C.*

## Meeker resigns

David Olan Meeker, executive vice president of the AIA for the last five-and-a-half years, has resigned effective at the end of the year. Meeker, 59, announced his decision at the AIA's fall quarterly board of directors meeting. He said he has met the goals he set for himself and for the AIA, and that the assured restoration of the Capitol's West Front is one of his proudest

achievements. Meeker also presided over the Institute's reorganization, and saw membership grow from 25,000 to more than 43,000. *Peter Hoffmann, World News, Washington, D.C.*





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## Management: Disability insurance protects you from possible disaster

*This second article on the subject describes the merits of group as distinct from individual coverage*

By Liame Leach Chapman

*In this second article, a manager from the Union Mutual Life Insurance Company describes in plain language the merits of group coverage for managers of design firms buying insurance for themselves and their employees, for employees who must weigh the true value of such insurance when it is offered as a company benefit, and for professionals considering group coverage plans offered by the AIA. Comparison between the group coverage described in this article and the individual coverage described in the earlier article (see RECORD, July 1983, page 43) will show significant differences between the two.*

*The first article listed a number of disturbing statistics on the probability of a person being disabled rather than dying. A person 35 years old is three times more likely to be disabled.*

*Between 35 and 65, seven out of ten persons will suffer a disability lasting longer than three months, and one out of seven will be in this unfortunate position for five years or longer.*

*These statistics show there is a compelling reason to consider disability insurance—either individual or group—particularly in view of the woeful inadequacy of Social Security coverage. Unless you have already planned ahead with insurance or some other disaster provision, these articles are well worth reading. C.K.H.*

If you, as an employer or employee, are relying totally on Social Security for disability protection, you will not be adequately covered. Disability benefits from Social Security will cover less than 20 per cent of a professional's salary.

In addition to low income-replacement levels, the Social Security Administration has a stringent definition of disability which is limited to "the inability to perform the duties of any gainful occupation" and limits benefits to disabilities expected to last at least 12 months or end in death. This definition is so restrictive that only about 45 per cent of those who apply for Social Security coverage ever receive benefits.

The features of a long-term-disability (or LTD) policy will make the difference between inadequate and adequate protection in the event of a disability, lacking some other contingency plan. Listed below are key features you should look at when purchasing such a policy:

**1. Definition of total disability.** A definition that states that a

person must be unable to perform each and every duty of his or her regular occupation to receive benefits is almost as stringent as the definition the Social Security Administration uses. The recommended definition of disability is "the inability to perform each of the material duties of one's regular occupation." In many group plans, this definition of regular occupation is usually applicable for a limited time period, generally two years. Only after that period does the definition become broader and encompass each of the material duties of any gainful occupation for which an individual is reasonably fitted by training, education or experience.

**2. Monthly benefit.** Benefits are stated as a per cent of gross. Recently, LTD carriers have raised their monthly maximum benefit to meet realistic levels. In fact, monthly benefits as high as \$25,000 are available to a selected clientele, including architects. The most popular benefit option for employees is 60 per cent of gross, although there are a variety of other benefit options available. These options can be calculated in a number of different ways, and you should request a detailed explanation from either the company representative or the broker.

**3. Guaranteed insurability.** Guaranteed LTD coverage, without the provision of medical evidence of insurability, means no one in your group will be turned down for coverage. Guaranteed insurability eliminates lengthy medical questionnaires and examinations. It's easier for employees to enroll in the plan, and the person in charge of administering the firm's insurance coverage is relieved from unnecessary paperwork. However, this feature may have other effects on your policy, such as cost, which should be examined.

Plans that do offer guaranteed insurability routinely contain a clause excluding coverage for pre-existing medical conditions. Employees with a pre-existing medical condition are required to fulfill specific waiting periods before a disability caused by that condition would be covered by the insurer. However, a disability caused by an unrelated condition would be covered as soon as the eligibility requirement is met. This type of arrangement is much more liberal than a policy that would not cover an employee at all if there were any pre-existing medical conditions.

**4. Partial disability.** This benefit

is designed to allow a disabled employee to return to work on a limited basis. The partial benefit encourages an employee to return to work by continuing to pay benefits that are reduced by a portion of the income earned by the claimant while working part-time.

If the disabled person is unable to return to his or her own occupation, most partial disability benefits will also pay a reduced benefit while the employee learns a new job.

**5. Cost-of-living adjustments.** This benefit is determined in accordance with the Consumer Price Index. Group LTD is a long-term plan, designed to cover income for the remainder of a professional's career. When inflation escalates, the lack of inflation adjustments could mean a serious setback to future liquidity to an employee.

**6. Integration factors.** Standard group LTD plans integrate with other income sources, such as Social Security. This helps lower the over-all cost of the plan.

Integration clauses vary widely, and you should understand how your prospective insurance carrier uses this mechanism. Examine carefully a plan that integrates with your firm's wage continuation plan or with individual noncancellable disability policies purchased separately by the firm's associates.

**7. Benefit duration.** This is the length of time that benefits will be paid to a disabled employee. Most employers choose a benefit duration which will continue benefit payments to age 65 or beyond, depending upon the age of the employee when the disability occurred.

**8. Elimination periods.** These are the lengths of time between the onset of a disability and the beginning of benefit payments. Most insurance companies offer elimination periods in 30-, 60-, 90- or 180-day intervals. Generally, a 90- or 180-day period is preferred because it helps to keep down the costs of the plan by minimizing costly, short-term claims.

**9. Fitness programs.** Disability insurers have increased their promotion of employee fitness programs. Similar to concepts encouraged by medical insurers, these programs are designed to promote and improve the health and well-being of employees, thus preventing illness and disease.

For example, some insurance companies now offer individualized health surveys as an option with their LTD plans. Employees complete a series of

questions directed toward their present lifestyle and health habits. The information is then evaluated and a confidential health summary is returned to employees offering suggestions to help them improve their current health status. Employers may also receive a composite report outlining the health and stress levels of their employees, while ensuring confidentiality of individual employees. This report enables employers to develop programs to minimize health risks among employees.

**Choose your insurer carefully**  
A carrier with a serious commitment to LTD stays in the business continually and will not have jumped in and out of it. It will also have the stability and financial resources necessary to support long-term risks. An experienced carrier will generally have a large block of LTD business, enabling it to use its own data base and risk experience and, therefore, to accurately determine the premium rates.

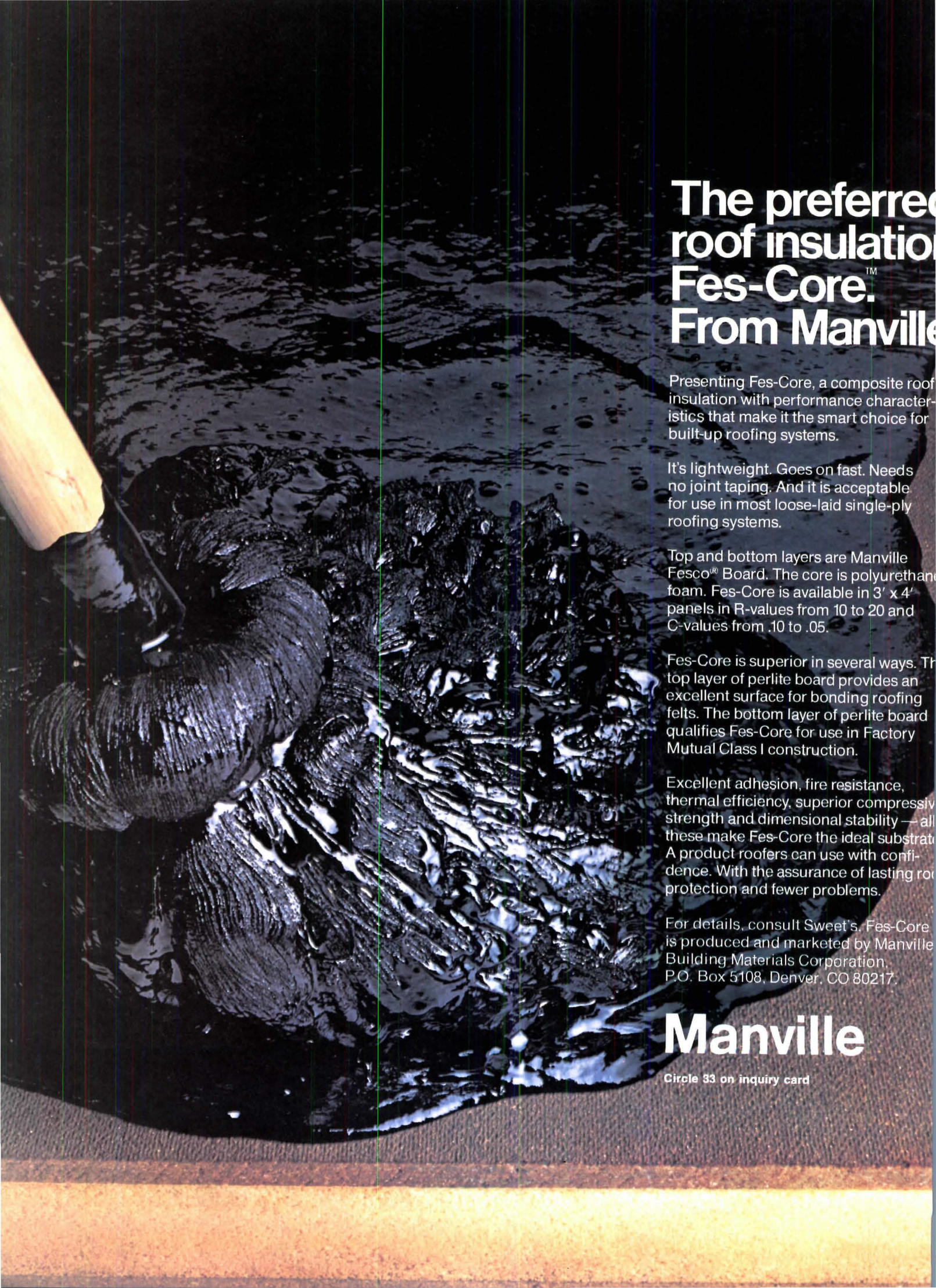
The company you choose should be willing and able to work closely with you on administrative details. Your initial contact with the sales representative of the company may give you a good indication of the type of service and professionalism you will receive.

The existence of a separate LTD claims department in the company means it can pursue every detail of a claim. The company should be able to provide disabled employees with information about the Social Security Administration and how to apply for benefits.

Additionally, it's worth looking into the insurer's commitment to worker rehabilitation. Today, some companies use in-house rehabilitation specialists to coordinate personalized rehabilitation programs. These specialists also work with outside community service agencies to help the disabled claimant return to work or to find alternative fields to work in, utilizing the training and experience of the claimant. Rehabilitation programs benefit not only the disabled employee, but show a concern on the part of the firm to helping this employee lead a full and productive lifestyle.

Ask the prospective company for the names of other clients you may contact for references. And lastly, on cut-rate premium offers, remember: "You get what you pay for."





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## Manville

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# Dodge/Sweet's Construction Outlook: Is 1984 the year for nonresidential building?

Prepared October 1983  
by the Economics Department,  
McGraw-Hill Information  
Systems Company;  
George A. Christie, vice president  
and chief economist.

So far, the 1980s have brought roughly equal measures of recession and recovery. Like the millionaire who said, "I've been poor and I've been rich, and rich is better," most of us would agree that recovery is a welcome improvement.

For the construction and building materials industries, recovery was ushered in by last year's break in interest rates which opened the way for a sustained rise in the Dodge Index. The better than 50 per cent improvement in this leading indicator of building activity since the spring of 1982 means that \$70 billion more new construction (at seasonally adjusted annual rate) is now being started than when the recovery first began.

Other measures of market activity confirm the strength of the 1982/83 upswing. At midyear, the value of construction put in place—the measure of work being brought to completion—was 20 per cent stronger than it was at the recession's deepest point. Simultaneously, the value of building materials being shipped to the job site also improved by 20 per cent. The remaining "gap" between contracting and construction put in place is a gauge of the bright near-term future of the building business. It represents the industry's cushion of unfilled orders.

As strong as this recovery has been over the past several quarters, it's not everybody's recovery—at least not yet. Up to this point the expansion of building activity has been a very one-sided affair, with 1983's contracting for residential building leading last year's total by 70 per cent at the eight-month mark, while nonresidential building has shown no gain at all. Once again the market is demonstrating that the building cycle is a sequential process.

## We've been here before

Experience tells us what *should* happen next. This is the time for the second stage of expansion to take hold in nonresidential building markets. And that's what the 1984 construction outlook is all about. Will this newest building cycle continue to develop in the time-honored style? Don't bet on it.

During the first year of recovery (mid-1982 through mid-1983), mostly normal and predictable things were happening to housing and public-works construction. Homebuilding surged as mortgage rates toppled from

their extraordinary peak of 18 per cent. Public-works spending was stepped up via the five-cent fuel tax and the Emergency Jobs Act. Recently there have even been some faint stirrings in the light-commercial building market—the usual side effect of a sustained pickup of housing.

It all sounds very familiar, but...

## What about some of the-not-so-normal features of this developing cycle?

- Except for the special case of highways, many other types of publicly financed construction are still wilting under the heat of budgetary restraint.
- Heavy industry is emerging from the recession of the early 1980s into an unfamiliar and highly competitive environment, which may require more capital spending—or less.
- The office building market was off on a boom all its own in the early 1980s, and now faces the near future with a growing surplus of space.

By the end of 1983, the events that shaped the initial stage of recovery will have run their course. There's little more expansion to be squeezed out of the housing or the public-works markets, although a case can be made for holding the gains of the recent past, at least through 1984. The recovery of commercial and industrial building has hardly even begun, and the next phase of the construction market's revival is waiting to happen in the nonresidential sector. However, it is there that the unexpected may happen. In 1984, as housing plateaus, the year-old recovery will either advance or stall in the markets for commercial and industrial building.

No forecast can be considered properly launched without at least a few basic assumptions. Three very broad ones will do the job:

- The economy's recovery is firmly established, and continued growth through next year will steadily absorb excess capacity and gradually reduce unemployment.
- Inflation will creep up, but only within the range of 4 to 6 per cent.
- Long-term interest rates are settling into a period of relative stability, with mortgages holding between 13 and 14 per cent.

Fortunately, it isn't necessary to make a guess about the outcome of next November's election. Nevertheless, the mere fact that an election is coming up will influence monetary and

fiscal policy in the meantime. For construction markets, it will be a positive influence.

## Residential building: The recovery has been stronger than expected

Over the past several quarters, the housing market has fulfilled last year's prophesy that a substantial decline in mortgage rates would result in a substantial gain in housing starts. As prophecies go, that was one of the easy ones, but even so, there were a few small surprises in the way it all worked out.

The decline of interest rates was *not* one of them. The Federal Reserve made it happen, and the only element of mystery was how far down rates would go before the Fed brought the process to a halt. For mortgages, the 13 per cent floor (down from 18 per cent) was quite accurately predicted.

One of the pleasant surprises was the amount of housing demand that 13 per cent mortgage money brought forth. Last fall's "consensus" forecast for 1983 was in the range of 1.3 to 1.4 million dwelling units—at that, a solid gain of one-third or more. However, the enthusiastic response of the market led to continuous upgrading of the year's potential, as the forecasting fraternity followed the market up to a total of 1.7 million units. Was this an indication of pent-up demand carried forward from two prior years of extremely low building, or was it a sign that borrowers didn't believe that 1983's "bargain" rates would last very long?

Another interesting aspect of 1983's housing rebound was the mix of one-family and multifamily. Conventional wisdom has it that falling mortgage rates are supposed to be a boon to home ownership, which ordinarily means one-family houses. And, of course, that did happen. But while it was happening, multifamily building soared 45 per cent to a surprising 660,000 units. It meant that condominiums (owner-occupied units which are counted, along with rentals, as multifamily dwellings) were also greatly stimulated by falling mortgage rates in 1983. Considering the cost spread between a 1,300-sq-ft condo and a typical 1,600-sq-ft single-family house, condos are becoming ever more viable substitutes for traditional one-family homes.

The regional pattern of 1983's housing recovery reflected the



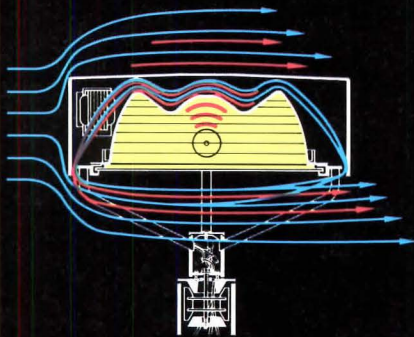


Diagram of external and internal air flow. Mere 5 m.p.h. breeze produces 40°F. to 50°F. temperature drop on internal components.

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# 1984 National Estimates

## Dodge Construction Potentials

Nonresidential Buildings	1983 Preliminary*	1984 Forecast	Percent Change 1984/83
<b>Floor Area</b> (millions of square feet)			
Office Buildings	252	182	-28
Stores & Other Commercial	360	427	+19
Manufacturing Buildings	101	128	+27
<b>Total Commercial &amp; Mfg.</b>	<b>713</b>	<b>737</b>	<b>+ 3</b>
Educational	71	67	- 6
Hospital & Health	80	75	- 6
Other Nonresidential Buildings	119	131	+10
<b>Total Institutional &amp; Other</b>	<b>270</b>	<b>273</b>	<b>+ 1</b>
<b>Total Nonresidential Buildings</b>	<b>983</b>	<b>1,010</b>	<b>+ 3</b>

Contract Value (millions of dollars)	1983 Preliminary*	1984 Forecast	Percent Change 1984/83
Office Buildings	\$18,300	\$13,750	-25
Stores & Other Commercial	13,600	16,225	+19
Manufacturing Buildings	5,425	7,400	+36
<b>Total Commercial &amp; Mfg.</b>	<b>\$37,325</b>	<b>\$37,375</b>	<b>—</b>
Educational	\$ 6,075	\$ 5,975	- 2
Hospital & Health	8,600	8,750	+ 2
Other Nonresidential Buildings	8,775	9,575	+ 9
<b>Total Institutional &amp; Other</b>	<b>\$23,450</b>	<b>\$24,300</b>	<b>+ 4</b>
<b>Total Nonresidential Buildings</b>	<b>\$60,775</b>	<b>\$61,675</b>	<b>+ 1</b>

### Residential Buildings

Dwelling Units (thousands of units**)	1983 Preliminary*	1984 Forecast	Percent Change 1984/83
One-Family Houses	1,015	1,100	+ 8
Multifamily Housing	660	625	- 5
<small>**F.W. Dodge basis</small>			
<b>Total Housekeeping Residential</b>	<b>1,675</b>	<b>1,725</b>	<b>+ 3</b>

Floor Area (millions of square feet)	1983 Preliminary*	1984 Forecast	Percent Change 1984/83
One-Family Houses	1,580	1,722	+ 9
Multifamily Housing	628	603	- 4
Nonhousekeeping Residential	75	67	-11
<b>Total Residential Buildings</b>	<b>2,283</b>	<b>2,392</b>	<b>+ 5</b>

Contract Value (millions of dollars)	1983 Preliminary*	1984 Forecast	Percent Change 1984/83
One-Family Houses	\$ 62,450	\$ 71,725	+15
Multifamily Housing	23,975	24,250	+ 1
Nonhousekeeping Residential	5,300	5,075	- 4
<b>Total Residential Buildings</b>	<b>\$ 91,725</b>	<b>\$101,050</b>	<b>+10</b>

### Nonbuilding Construction

Contract Value (millions of dollars)	1983 Preliminary*	1984 Forecast	Percent Change 1984/83
Highways & Bridges	\$ 15,450	\$ 16,950	+10
Sewer & Water	7,525	7,400	- 2
Other Public Works	6,750	6,500	- 4
<b>Total Public Works</b>	<b>\$ 29,725</b>	<b>\$ 30,850</b>	<b>+ 4</b>
Utilities	\$ 9,500	\$ 11,000	+16
<b>Total Nonbuilding Construction</b>	<b>\$ 39,225</b>	<b>\$ 41,850</b>	<b>+ 7</b>

### All Construction

Contract Value (millions of dollars)	1983 Preliminary*	1984 Forecast	Percent Change 1984/83
<b>Total Construction</b>	<b>\$191,725</b>	<b>\$204,575</b>	<b>+ 7</b>
<b>Dodge Index (1977 = 100)</b>	<b>137</b>	<b>146</b>	

general loosening of credit more than it did the differentials in housing demand from one area to another. All four regions surged ahead as mortgage rates fell, with the West leading the others, and the North Central trailing moderately.

Now that interest rates have not only stopped falling, but have crept part-way back, the focus turns to questions like, "How long will it be before the next cyclical decline of housing starts sets in?" As long as short-run housing market behavior continues to be the mirror image of interest rates (and that's almost as dependable as Newton's Third Law of Motion), the answer rests, as always, with the money market. If we assume that mortgage money—now back up to 13 3/4 per cent—will remain steady at its current level, then we can expect that 1984's residential building will be at least the equal of 1983's total of 1.7 million units, and maybe a bit more. But stability has not been a characteristic of interest rates in the era of monetarism. What then, are the arguments to support the critical assumption that there will be an adequate supply of mortgage money available in 1984 at the acceptable rate of 13 to 14 per cent?

The Federal Reserve has more and better reasons to keep interest rates where they are than to force them up again by squeezing the money supply. The main justification for another round of severe monetary restraint would be to head off a resurgence of inflation, but that just isn't a real concern for the short run. Food prices will probably push up the Consumer Price Index a bit next year, but even so, inflation at 5 per cent (vs. 4 per cent in 1983) has to be an acceptable alternative to the risk of yet another credit-crunch recession. To support the economy's continued improvement through 1984, monetary policy must be moderately expansive, and the Fed recently prepared the way for this by raising its M targets to 5 to 9 per cent.

"Crowding out" isn't a serious threat in 1984. As long as the Fed leans toward the higher end of its monetary growth range, there should be enough credit to meet all the economy's needs—including housing. As the economy's recovery strengthens, business demand for capital must be expected to increase, while Treasury borrowing eases somewhat with rising tax revenue. As this tradeoff in the

demand for credit occurs, a record \$32 billion of outstanding mortgage commitments by thrift institutions should keep the housing industry going through 1984.

### Housing outlook: More of the same—then a gradual decline

Difficult as it is to imagine the normally volatile housing market suspended at any level of output for long, this is the most likely prospect for 1984. Stability is not without precedent, even if it is rare. It happened as recently as 1981-82, when extremely tight money held housing output to only 1.1 million units for two consecutive years. This time, however, the market will enjoy an extended stay at the upper end of the cycle as a total volume of 1.725 million units (F.W. Dodge basis) is the 1984 forecast. Even the mix of structure types is likely to resemble 1983's results, with 1.1 million one-family homes and 625,000 multifamily units.

Residential building contract value, which soared more than 50 per cent in 1983 to \$91.7 billion, is expected to exceed \$100 billion in 1984.

Household formation doesn't usually carry much weight in short-term forecasting, but the demographics of the housing market have been so far off course in the early 1980s that they could influence the market in 1984 and 1985. So far in the decade, household formation has been extremely low, averaging only 1.1 million per year. That contrasts with an annual average of 1.7 million during the 1970s. Temporary conditions, like high unemployment and a restricted supply of shelter, would explain much of the drop, pointing to the likelihood of a considerable amount of "doubling up" (newlyweds living with relatives, for example). That would mean there's a substantial backlog of housing demand—especially for condos and apartments—still to be met as households "double" over the next couple of years.

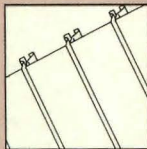
The presence of a backlog of demand (a positive force), along with the probability of gradually rising interest rates over the next few years (negative), sets parameters for the short-term housing outlook. They suggest continued strong short-run conditions, reaching a peak in housing starts toward the end of 1984, followed by a gradual winding down, rather than a steep decline, as has often been the case in the past.



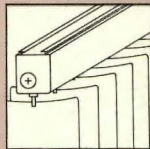


Architectural model, courtesy Hanes Lundberg Washler

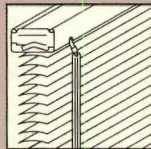
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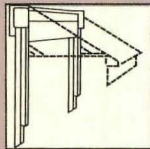
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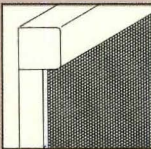
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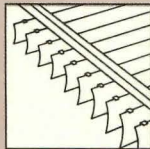
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**Nonbuilding construction: Two new programs give public works a boost**

Two opposing forces are battling for domination of the public-works construction market. One, the "New Federalism," involves the systematic transfer of responsibility for construction and maintenance of the nation's highways, bridges, mass transit, water resources, and waste-treatment facilities from the Federal government to local governments. The other, which might be called the "Old Keynesianism," concerns the use of these same public-works programs as a means of stimulating the economy and creating jobs. If the ghost of J. M. Keynes seems to have the upper hand, it has only been very recently, and won't be for long.

Since 1980, the reorientation of

public-works construction from Federal to local governments has had a generally negative outcome, because the Feds were able to withdraw faster than the locals could expand. The 1980s have not been kind to local governments.

Some of the consequences of this one-sided tradeoff: between 1980 and 1982, Federal outlays (direct spending plus grants to local governments) through the major public-works programs were reduced to approximately 85 per cent of the amount authorized by existing legislation. Contracting for public-works construction slipped from a peak of \$29 billion to \$26 billion—a decline of 10 per cent, suggesting that local governments were able to share a bit more of the load. But after adjustment for inflation, the

hard fact is that in 1982, the combined total of public-works construction—measured in constant dollars—had shrunk by nearly one-fourth from its peak volume at the end of the 1970s.

Early in 1983, the switch to the traditional use of public works as an antirecession stimulus reversed that decline abruptly. The passage, in rapid succession, of the Surface Transportation Assistance Act (January) and the Emergency Jobs Appropriations Act (March) cleared the path for additional billions of public-works spending in order to help the economy out of its deepest recession since the Thirties.

STAA, the bigger of the two new programs, brought instant relief. Its five-cents-per-gallon fuel tax, 80 per cent of which is dedicated to highway/bridge construction and 20 per cent to

mass transit, will generate an estimated \$23 billion of construction over the next four years. Its impact in 1983's second quarter was all that could be expected: from a seasonally adjusted annual rate of \$12 billion in the opening (pre-STAA) quarter, contracting for highways and bridges surged to \$16 billion in the second, and that became the point of departure for the next several years.

It is important to appreciate that the new tax has not altered the underlying trend of highway construction. What it has done is create a \$4 billion "step" in 1983 which will last four years. Growth—including the "step" will still be determined by fuel consumption, which is the primary source of revenue for both the basic Highway Trust

**1984 Regional Estimates Dodge Construction Potentials**

**North-east** CT, ME, MA, NH, NJ, NY, PA, RI, VT

	1983 Preliminary*	1984 Forecast	Percent Change 1984/83
<b>Contract Value (millions of dollars)</b>			
<b>Nonresidential Buildings</b>			
Commercial and Manufacturing	\$ 6,150	\$ 5,950	- 3
Institutional and Other	4,050	4,200	+ 4
<b>Total</b>	<b>\$10,200</b>	<b>\$10,150</b>	<b>—</b>
<b>Residential Buildings</b>			
One-Family Houses	\$ 6,875	\$ 8,050	+17
Multifamily Housing	3,850	4,225	+10
Nonhousekeeping Residential	1,025	1,125	+10
<b>Total</b>	<b>\$11,750</b>	<b>\$13,400</b>	<b>+14</b>
<b>Nonbuilding Construction</b>			
Highways and Bridges	\$ 2,275	\$ 2,650	+16
Other Public Works	2,800	2,675	- 4
Utilities	400	700	+75
<b>Total</b>	<b>\$ 5,475</b>	<b>\$ 6,025</b>	<b>+10</b>
<b>Total Construction</b>	<b>\$27,425</b>	<b>\$29,575</b>	<b>+ 8</b>

**North Central** IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI

	1983 Preliminary*	1984 Forecast	Percent Change 1984/83
<b>Contract Value (millions of dollars)</b>			
<b>Nonresidential Buildings</b>			
Commercial and Manufacturing	\$ 6,875	\$ 7,050	+ 3
Institutional and Other	4,375	4,550	+ 4
<b>Total</b>	<b>\$11,250</b>	<b>\$11,600</b>	<b>+ 3</b>
<b>Residential Buildings</b>			
One-Family Houses	\$10,200	\$11,725	+15
Multifamily Housing	2,950	3,150	+ 7
Nonhousekeeping Residential	650	600	- 8
<b>Total</b>	<b>\$13,800</b>	<b>\$15,475</b>	<b>+12</b>
<b>Nonbuilding Construction</b>			
Highways and Bridges	\$ 4,300	\$ 4,400	+ 2
Other Public Works	3,000	2,775	- 7
Utilities	1,400	1,700	+21
<b>Total</b>	<b>\$ 8,700</b>	<b>\$ 8,875</b>	<b>+ 2</b>
<b>Total Construction</b>	<b>\$33,750</b>	<b>\$35,950</b>	<b>+ 7</b>

**South** AL, AR, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV

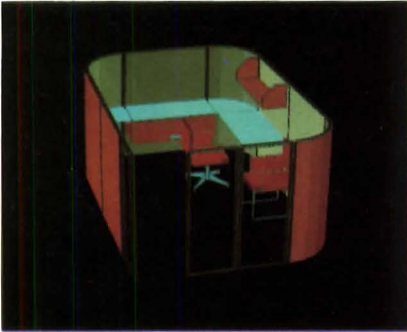
	1983 Preliminary*	1984 Forecast	Percent Change 1984/83
<b>Contract Value (millions of dollars)</b>			
<b>Nonresidential Buildings</b>			
Commercial and Manufacturing	\$15,025	\$14,850	- 1
Institutional and Other	9,050	9,250	+ 2
<b>Total</b>	<b>\$24,075</b>	<b>\$24,100</b>	<b>—</b>
<b>Residential Buildings</b>			
One-Family Houses	\$29,325	\$32,900	+12
Multifamily Housing	11,175	10,725	- 4
Nonhousekeeping Residential	2,300	2,175	- 5
<b>Total</b>	<b>\$42,800</b>	<b>\$45,800</b>	<b>+ 7</b>
<b>Nonbuilding Construction</b>			
Highways and Bridges	\$ 5,850	\$ 6,400	+ 9
Other Public Works	5,075	5,050	—
Utilities	3,600	4,400	+22
<b>Total</b>	<b>\$14,525</b>	<b>\$15,850</b>	<b>+ 9</b>
<b>Total Construction</b>	<b>\$81,400</b>	<b>\$85,750</b>	<b>+ 5</b>

**West** AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY

	1983 Preliminary*	1984 Forecast	Percent Change 1984/83
<b>Contract Value (millions of dollars)</b>			
<b>Nonresidential Buildings</b>			
Commercial and Manufacturing	\$ 9,275	\$ 9,525	+ 3
Institutional and Other	5,975	6,300	+ 5
<b>Total</b>	<b>\$15,250</b>	<b>\$15,825</b>	<b>+ 4</b>
<b>Residential Buildings</b>			
One-Family Houses	\$16,050	\$19,050	+19
Multifamily Housing	6,000	6,150	+ 3
Nonhousekeeping Residential	1,325	1,175	-11
<b>Total</b>	<b>\$23,375</b>	<b>\$26,375</b>	<b>+13</b>
<b>Nonbuilding Construction</b>			
Highways and Bridges	\$ 3,025	\$ 3,500	+16
Other Public Works	3,400	3,400	—
Utilities	4,100	4,200	+ 2
<b>Total</b>	<b>\$10,525</b>	<b>\$11,100</b>	<b>+ 5</b>
<b>Total Construction</b>	<b>\$49,150</b>	<b>\$53,300</b>	<b>+ 8</b>



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The "Jobs Act" works differently. Instead of bringing "new money" into the construction market, this measure was designed to accelerate the spending of funds already authorized for existing programs in future years. Of the \$8.8 billion of additional funds appropriated for "public works," less than half (\$4.2 billion) involves construction, and its impact will be hard to identify. At least 32 different types of construction are involved, with Community Development Block Grants getting the biggest share.

If the spirit of this program is carried out, the extra funds allocated to 1983 and 1984 budgets will not be available for use in the later years for which they were originally authorized.

**Public-works outlook: Expansion will continue—but not for long**

The conflicting motives of economic stimulus and budgetary restraint are giving the public-works construction market some new twists, but no consistent direction. A few things are clear, however. The decline of the past three years has been reversed by a 15 per cent gain in 1983. By far the biggest improvement has been concentrated in transportation facilities, most especially highways and bridges. Because the new programs that are responsible for 1983's turnaround were operational for only part of the past year, 1984 contracting for public-works construction is likely to be still higher as they develop their full potential.

As in 1983, roadbuilding will be the source of most of next year's further gain, offsetting continued weakness in waste-water treatment facilities and water-resource projects which rely heavily on Federal funding. A net gain of 4 per cent in contracting for total public-works construction will bring the year's value above \$30 billion for the first time, but will probably not quite match next year's mild rate of inflation. To the extent that local governments are required to assume an even larger share of public-works expense, the decline of municipal bond rates over the past year should ease some of the burden.

Like housing, (although to a lesser degree), public-works construction got its big boost in 1983. And, like housing, it has the potential for still a little more "residual" expansion in 1984, as the forces that led to the

past year's turnaround play themselves out. Before long, the outcry for economic stimulus will be drowned out by warnings of renewed inflation, and budgetary restraint will again dominate the public-works market.

**Utilities**

Plagued with too much capacity, the electric utility industry reduced its contracting for new generating facilities to \$9.5 billion in 1983. The year's decline of more than 15 per cent reversed a tenuous recovery of electric utility contracting that had been under way since the post-nuclear era began in 1980.

Ten major projects, located primarily in the South and West, were responsible for most of the 1983 total. However, the past year also brought the "indefinite postponement" of as many other projects, as utilities continued to adjust to a more realistic view of the need for electricity over the next decade.

Although the continued improvement of the economy should strengthen the demand for energy, utility contracting will be showing only a moderate gain in 1984. The multi-billion-dollar bond default by a Northwestern utility, when it cancelled two projects last summer, added an element of financial uncertainty to the industry's underlying problem of excess capacity.

Analysis of 50 projects at the planning stage indicates that at least eight, and as many as 10, new power plants are likely to be started in 1984—again mostly in the Sunbelt. The value of next year's contracting for utility projects is estimated at \$11.0 billion.

**Nonresidential building: Different directions for different categories**

There is not much risk that either housing or public-works construction will fall back in 1984 from the greatly improved levels they both reached in 1983. But neither is there much opportunity for further expansion in the year ahead. This impasse puts the nonresidential building sector in a crucial role. It is there that the construction industry's year-old recovery will either fizzle or develop its full potential.

The chart above lends a great deal of credibility to the axiom that wherever the construction market is going, housing will get there first. The corollary is, of course, that once housing makes its move, nonresidential building is quick to follow.

Housing leads other forms of building because it is more sensitive to changes in credit conditions and because it requires less start-up time. Nonresidential building lags because its demand is often derived from housing (stores and other light-commercial building, for example) and because its typically larger projects require more planning time.

True to form, the peaks and troughs of the housing cycle have been faithfully reproduced in contracting for nonresidential building even through the stress of the past several years: in 1979 (peak); in 1980 (both peak and trough); and again in 1982 (trough). In 1983, a second-quarter upturn of nonresidential building could be the sign that the latest housing recovery has now begun to exert its pull.

Although leads and lags are helpful for gauging the *timing* of building cycles, they don't reveal much about the *strength* of demand. To get at this, it is necessary to probe deeper, examining some of the key categories of nonresidential building individually. Four of them—stores, offices, factories, and "institutional" buildings—deserve special treatment.

At this point in the cycle—on the threshold of a broad recovery of nonresidential building—these key categories are pointing in several different directions. Retail building is firmly up. Industrial building appears to be making its turnaround. Office building is still declining. Institutional building seems to be wandering aimlessly. How these individual building markets develop through 1984 will not only determine the nonresidential building outlook, but will have a considerable bearing on how much the *total* construction market can improve next year.

**Retail building: It's beginning to respond to the housing recovery**

The unfolding pattern of the housing cycle and, to a lesser degree, the strength of consumer spending will determine the pattern of contracting for stores and warehouses in the quarters ahead.

The recovery of homebuilding, which began in the spring of 1982, was beginning to coax a tenuous response in retail building even before 1983 began. A gain in contracting for stores in 1982's final quarter was the earliest sign of a turnaround of the three-year-long decline of nonresidential building. At the

time, however, this small beginning of recovery was overwhelmed by deepening declines in contracting for offices and industrial construction which was pulling *total* nonresidential building to its cyclical low point of 896 million sq ft.

Steady improvement in contracting for stores and warehouses through the first three quarters of 1983 has brought the retail building market well within reach of this year's estimated total of just under 300 million sq ft, an improvement of 23 per cent over 1982's exceptionally low volume.

So far, in recovery, contracting for stores and warehouses is showing a reasonably balanced relationship with housing throughout the North Central, the South, and the West, but it seems to be trailing in the Northeast.

**Retail outlook: A couple of years of catching up**

As housing starts lose their early momentum and level off in the range of 1.70 to 1.75 million units for the next several quarters, there will be a need for some "catching up" to bring retail building into line with this volume of residential building.

Past experience shows that a volume of 1.7 million housing starts should be capable of supporting as much as 400 million sq ft of retail building. But it won't all happen in 1984, due to the familiar lag. Allowing for housing's two-quarter headstart, 1983's gain of 57 per cent converted into a 23 per cent advance in contracting for stores and warehouses. In 1984, when the potential for further expansion of homebuilding is limited to only 5 per cent or less, retail building will pick up another 20 to 25 per cent. Even then—at an estimated 366 million sq ft, stores and warehouses will not have reached full potential. In 1985, a further gain of 10 to 15 per cent will be needed to establish "parity" with housing.

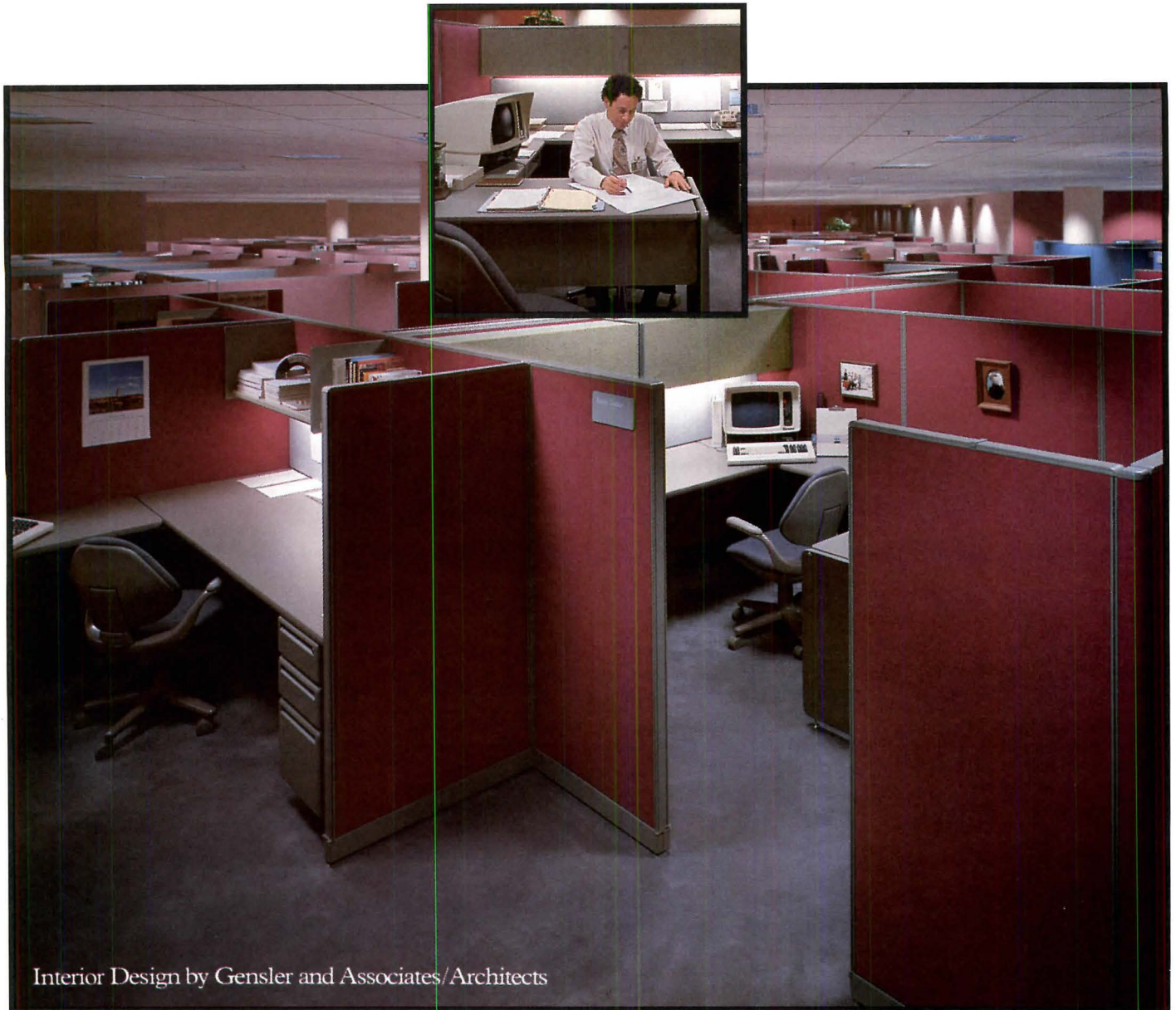
**Manufacturing building: Excess capacity won't delay the turnaround**

Now that rising industrial production is beginning to take up the large volume of excess plant capacity that was the legacy of three years of off-and-on recession, the time has come for a welcome recovery of industrial construction.

Since the last peak was reached in 1979, contracting for



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manufacturing building declined steadily—from 243 million sq ft to less than half that volume by 1982. In 1983, the beginning of what may be a different kind of recovery is finally taking hold.

After a decade or more of underinvestment in plant and equipment, American industry finds itself at a distinct disadvantage in world markets. If this economy is to recapture some of its former prominence as an industrial power, a larger share of GNP must be diverted into capital spending. Whether by the indirect route of tax incentives or by the adoption of a more formalized "industrial policy," conditions are favorable for an era of better-than-average industrial development. Only time will tell whether its potential will be realized or other priorities will take precedence.

For the short run, which is of greatest concern here, the signs are good. Recovery of industrial building has begun, and the obsolescence of existing capacity seems to be one motive for a stronger rebound than previous experience would indicate. Although industry is carrying a high percentage of excess capacity into the current recovery, much of it is not competitive capacity and may never be reactivated. Perhaps because of this, the current cycle of industrial building is showing more of a "V-shaped" trough and a stronger initial rebound than the long, flat bottom of the mid-1970s' recession.

**Plant-building outlook: Conditions are ripe for a strong rebound**

Owing to an extremely weak first quarter of only 88 million sq ft, recovery through the balance of 1983 to 112 million by the final quarter will leave this year's total at only 101 million sq ft (the fourth consecutive annual decline). In 1984, however, when capacity utilization is expected to average close to 80 per cent, contracting for industrial construction is estimated to total 128 million sq ft, a gain of 27 per cent. By 1987, annual volume is expected to exceed 200 million sq ft.

One indication of what a long way back it will be for the industrial building market: next year's forecast gain of 28 per cent will still leave the 1984 total below the worst year of the mid-1970s' cycle.

**Institutional building: Diverging trends in schools and hospitals**

One of the few construction

markets to remain insulated from the business cycle, institutional building marches instead to the demographic drummer. Schools and hospitals, the two most important building types in this group, offer an interesting contrast. By their responses to the changing composition of the nation's population, both building markets are headed toward the common level of 70-80 million sq ft annually, but from opposite directions.

- A *shrinking* student population has steadily reduced the demand for educational building from a peak (in the late '60s) of nearly 250 million sq ft annually to the current (1983) volume of only 71 million sq ft. Significantly, half of all educational building now consists of additions and alterations to existing structures.
- An *expanding* older population (the over-65s are currently increasing twice as fast as the rest of the population) implies an intensified need for hospitals and nursing homes. This highly specialized building market, which only a decade ago was faced with a surplus of facilities, is now at the beginning of a period of renewed growth.

**Institutional-building outlook: An end of the decade of decline**

In 1984, a slim 1 per cent advance (to 273 million sq ft) will help to sustain the newly upward trend of total institutional building, following nearly a decade of steady decline. For most of the 1980s, however, renewed growth of institutional building will remain inhibited by the further decline of educational building. Even as the demographics of the school market begin to turn around as a result of an "echo effect" of the Fifties generation, the need to build new elementary schools will be limited by the vast stock of underutilized facilities.

Because of diverging trends in the individual categories of institutional building, it will be very late in the decade (1988, perhaps) before annual square footage again reaches 300 million.

**Office buildings: A correction is due in an overbuilt market**

The wind-down from the great office building boom of the early 1980s got off its track in 1983. After reaching a peak of 325 million sq ft in 1981, contracting eased to 261 million in 1982—still a very high rate of building. But in 1983, instead of declining

further as widely expected, office building held virtually even with 1982's strong volume. That just pushed the inevitable correction for several years' overbuilding another year into the future.

A brief chronology of the events leading to the present imbalance in the office building market points the way to 1984 and 1985:

- White-collar employment rose spectacularly in the late 1970s, reaching a peak gain of 2.2 million in 1979 (vs. 1.5 million per year in the mid-1970s).
- Office building increased sharply in response—from 207 million sq ft in 1978 to a record 325 million by 1981.
- By 1981, however, the conditions that led to this building boom had already changed. White-collar labor-force growth was slowing. Recession was driving unemployment up. The office-vacancy rate was beginning to rise.
- In 1982, even though office contracting was cut back 20 per cent (to 261 million sq ft), vacancies rose sharply as previously started projects were completed and available for occupancy.
- In 1983's first half, a surprising thing happened. Contracting for office space increased again, almost back to the extraordinary 1981 rate of building.

Only one word is needed to describe the office building market in the fall of 1983: *overbuilt*. A match-up of the cumulative additions to the supply of space (square footage of contracting) since the mid-1970s with the cumulative demand for it (the net growth of the white-collar workforce) reveals a surplus of nearly a full year's building. The double-digit vacancy rate for offices bears it out.

To make matters worse, the high rate of office starts that has persisted through 1983 is aggravating rather than easing the problem. Analysis indicates that a total of 225 million sq ft is the most that can be absorbed in a year by the current rate of growth of the labor force. Any volume of building higher than this (1983's total will be over 250 million), adds still more to the already existing glut of space.

If current labor force growth cannot support more than 225 million sq ft of new construction per year, the existing surplus will be reduced only by adding less than 225 million sq ft for the next few years. All evidence points to a decline of office building in 1984 (and in 1985 as well). The issue: Is the market

due for a collapse, or a gradual adjustment?

The regional distribution of the surplus of office space adds another necessary dimension to the outlook. With the current excess supply heavily concentrated in a number of major metropolitan areas throughout the South and Southwest (Denver, Dallas, Houston, and San Diego are some of the conspicuous ones), there remains a narrow majority of office building markets (New York and Chicago among them) that still enjoy a reasonable balance of supply and demand. The prospect that a sizeable number of cities can continue to support their normal volume of building during the adjustment period suggests that the correction to the excesses of the early 1980s will take the form of an extended decline rather than a sudden collapse.

**Office-building outlook: Two years of decline in sight**

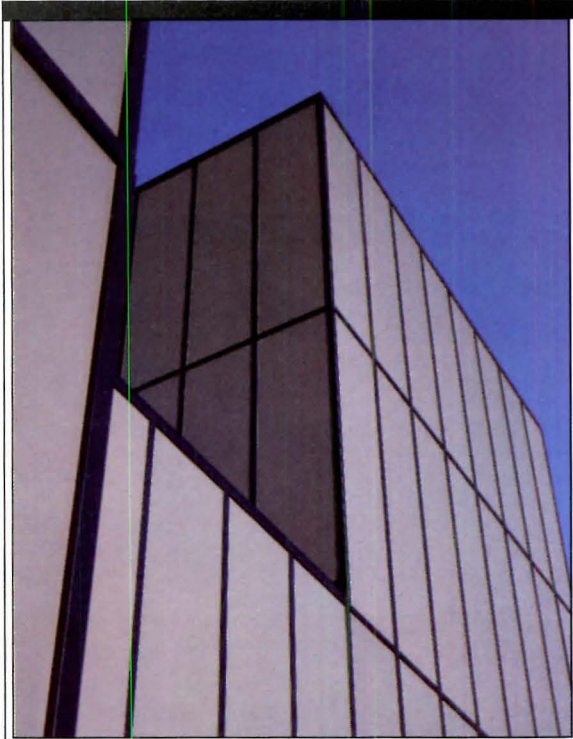
With the rate of contracting still above 250 million sq ft in 1983's third quarter, a pattern consistent with an extended decline might find 1984's contracting beginning at a rate close to 200 million sq ft and finishing around 165 million for a total of 182 million sq ft (a decline of 30 per cent). A further decline—to the range of 125 to 150 million sq ft—is indicated for 1985.

**Total nonresidential: Contract value should be equal to 1983**

The 1984 nonresidential building market looks better if it is approached selectively rather than collectively. Next year's recovery will have three unusual features, all due to the distorting influence of the maverick office-building cycle.

- As the table below shows, the combined total of all nonresidential building *excluding offices* is headed for a healthy 13 per cent gain in square footage in 1984. That's just about on a par with the recovery from the mid-1970s recession (+14 per cent), and a lot stronger than the one before that (+8 per cent). But with the inclusion of offices, which will be going the other way in 1984, next year's total nonresidential square-footage gain is reduced to only 3 per cent—just about the same nominal increase as forecast for housing.
- While total nonresidential square footage is expected to increase by a net 3 per cent in





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### Housing and the Retail Building Lag

Year	Dwelling Units (000)		Retail Sq. Ft. (000,000)	
1980	1,331	-25%	378	-26%
1981	1,127	-15%	337	-11%
1982	1,093	-3%	245	-27%
1983	1,675	+53%	298	+22%
1984	1,725	+3%	366	+23%
1985	1,675	-3%	415	+13%

### Manufacturing Building and Capacity Utilization

Year	Manufacturing Capacity Utilization (%)	Manufacturing Building Sq. Ft. (000,000)
1980	80	216
1981	79	187
1982	71	118
1983	74	100
1984	79	128
1985	81	154

### Nonresidential Building Square Footage (in millions)

	1983	1984	1984 Gain
Commercial & Industrial, (excluding Offices)	461	555	+20%
Institutional	270	273	+ 1%
Total (excluding Offices)	731	828	+13%
Offices	252	182	-28%
Total Nonresidential	983	1,010	+ 3%

### High Rise/Low Rise

Percent of Total New Office Square Footage in Buildings With Five or More Stories

Year	Percent	Year	Percent
1970	54	1977	27
1971	50	1978	33
1972	45	1979	36
1973	40	1980	44
1974	33	1981	54
1975	31	1982	48
1976	26	1983(p)	49

1984, contract value of nonresidential building will be virtually unchanged. Although cost pressures are apt to remain low in 1984, this stability does not imply "negative inflation." It is what happens in the trade-off of light commercial building (at \$40.00/sq ft) against offices (at \$75.00/sq ft).

The counter-cyclical movement of offices is apt to give the nonresidential building cycle a "double bottom." One trough has already occurred, and that was the true cyclical bottom in 1982's fourth quarter at 896 million sq ft. The other is likely to appear during 1983:IV and 1984:I, when declines in office building temporarily outweigh gains in other building types. By 1984's second quarter, however, the negative influence of offices will be less pronounced, and recovery will be less inhibited.

### After 1984: Familiar threats to the new building cycle

All through 1983, the recovery of the construction market has been retracing familiar steps. Early gains in housing and public works are now pointing the way to further expansion into commercial, industrial, and other nonresidential building. It is at this point, however, that the 1983/84 recovery departs from past patterns and begins to develop a style of its own.

In 1984, the extension of the construction industry's potential into nonresidential building will be hindered by an overbuilt office market which requires a corrective decline in building.

Beyond 1984, some issues which have been dormant for the past year or two will take on greater importance. One is the uncharacteristically high level of interest rates that prevailed even as recovery began. The other is the almost forgotten (but not gone) Federal deficit.

The threat of high interest rates to the construction industry does not need great elaboration. Even if mortgage rates were to hold steady at 13 per cent, a part of the housing market's potential would remain disenfranchised. More than that, when rates rise again—as must be expected once the economy begins to heat up—there is precious little room between the present level where rates are barely workable and the point where they become unworkable again.

The infamous \$200 billion budget deficit is more complicated, but no less threatening to the future of the

construction industry. For the time being, the deficit is both foe and friend: foe, because the Treasury's huge borrowing requirements to finance it are keeping interest rates from falling to a more reasonable level; friend, because it is the source of the considerable fiscal thrust that is driving the economy's recovery. In another year or so, the deficit will begin to take on a decidedly less friendly manner. As the present slack is taken up, the deficit's value as a source of stimulus has to be weighed against its cost as a source of inflation.

To gain control of the deficit before it becomes an engine of inflation requires at some point that taxes be raised and spending restrained. To hope that an expanding economy will somehow generate enough revenue to close the deficit without a tax increase is unrealistic. It won't, and the failure to raise taxes would leave only the alternatives of accepting higher inflation or relying on monetary restraint to keep it in check. The first three grim years of the 1980s are a case study in suppressing inflation with monetary restraint. It hardly needs to be added, except for emphasis, that credit-sensitive industries like construction bear a disproportionate share of the cure.

Projections of huge budget deficits extending far into the future present some difficult post-election choices. Experience suggests that the resolution of the deficit problem will be a compromise involving a blend of taxation, inflation, and monetary restraint during the mid-1980s. Clearly, this poses a major risk to the later-stage development of the new building cycle that is still taking form.

For 1984, however, the risks are minimal. During election years, legislators traditionally do not raise taxes, and central bankers usually try to be accommodating. With inflation dormant for the time being, external circumstances can be depended upon to be supportive through 1984 as the building cycle begins to include its absent nonresidential sector. The most urgent short-run problem will be the one that has developed within the construction market itself: the unwinding of the office building boom.

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comprise 65,000 square feet of space in a precast concrete structure located within the city's Civic Center District. Because studio heights of 12 to 15 feet were needed to accommodate

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## Making a point



The typical flat-top, postwar skyscraper may not be completely obsolete, but it is certainly getting a run for its money in New York. The latest in a seemingly endless parade of unusually crowned buildings is a luxury condominium project currently rising near the United Nations. Der Scutt, in association with Schuman, Lichtenstein, Claman & Efron, has designed a 250-unit brick-and-glass tower that rises 41 standard stories before terminating dramatically in an eight-story "prismatic pinnacle" of terraced penthouse apartments that extend the full width of the building. The triangular profile of the top is echoed all the way down the structure in a series of projecting balconies on the south facade and in the arched treatment of the ground-floor windows.

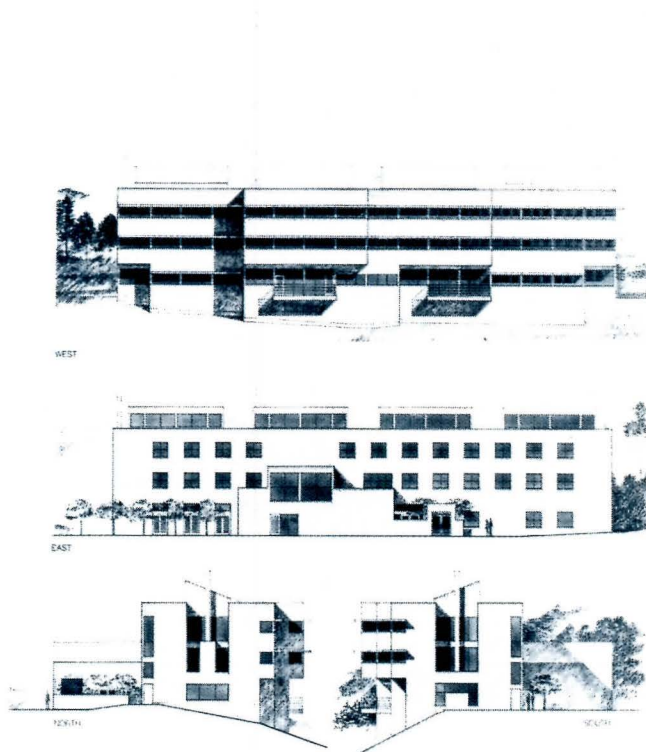
## Encouraging good design



## Berkeley builds research facility

The new Mathematical Sciences Research Institute at the Berkeley campus of the University of California will provide 22,000 square feet of space for scholars engaged in independent study for periods ranging from three months to two years. Designed by Shen/Glass Architects for a hilltop site overlooking the East Bay area, the competition-winning scheme

is organized around a three-story-high atrium and includes a library, commons areas, a lecture hall and seminar room, and 54 private offices for Institute members. In contrast to the many stucco-covered buildings in the vicinity, the structure will be clad in the narrow cedar clapboards frequently employed in early domestic architecture of northern California.



Situated on a prominent corner site that fronts Fountain Square, Cincinnati's physical and symbolic heart, 525 Vine Street is a 487,000-square-foot speculative office tower that represents the first visual manifestation of Cincinnati 2000, the city's new incentive zoning plan that encourages mixed-use construction downtown. Traditional local ordinances would have dictated a nine-story building on the 88-foot-wide site; however, by agreeing to include such amenities as a seven-story public atrium, two floors of retail space, and second-story skywalks, the developers were able to erect a more economically sound 23-story tower that utilizes the air rights from an adjacent alley. Architects of the gray-green precast concrete structure are Glaser & Myers and Associates.

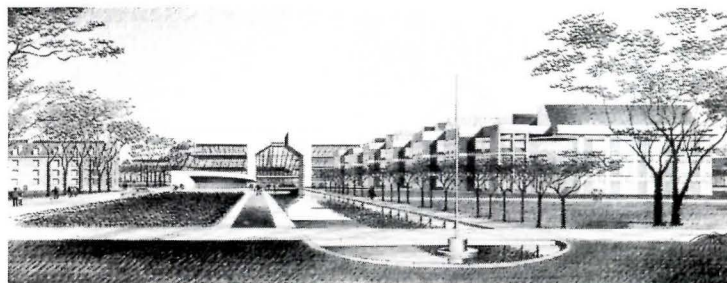
## A Cambridge confection



"We hoped to create a structure that would have its own sense of place," observed architect Graham Gund. And sure enough, the little wooden guardhouse recently erected just outside Harvard Yard maintains a strong identity amid the red brick and ivy of the adjoining academic enclave—much to the delight or chagrin of area residents. Pseudonymous letters to the *Harvard Crimson* from the likes of Hansel and Gretel and Raggedy Ann and Andy suggest that the five-foot-square, peaked-roof structure might be more comfortable in either the Black Forest or a little girl's bedroom. Another note to the paper, however, called the gatehouse "a little gem. . . the best piece of construction Harvard has added in the last 50 years." Whatever the case, the gatehouse had to meet the high standards of the Cambridge Historical Commission, whose director Charles Sullivan praised the building for its subtlety. "It's more postmodernist than pseudo-Victorian," he noted, adding that the commission felt the final design was lighter and less obtrusive than the neo-Georgian brick structure proposed by some critics. The total cost: about \$1,000 per square foot.

## A science center for Oklahoma State

The new Center for Agriculture and Natural Resources at Oklahoma State University will provide 220,000 square feet of space devoted to the scientific disciplines of geology, plant pathology, microbiology, and entomology. The competition-winning design is by The Architects Collaborative, in association with Frankfort-Short Bruza and Dubin/Bloom.





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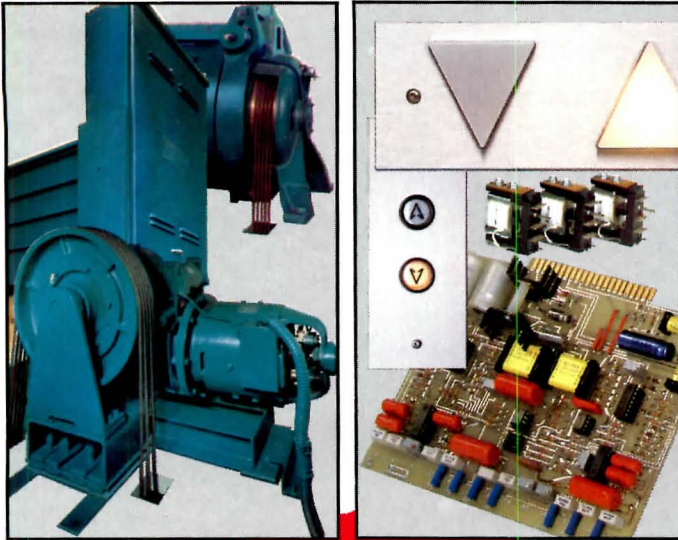
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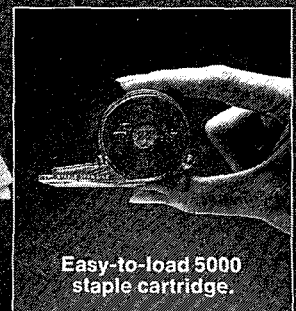
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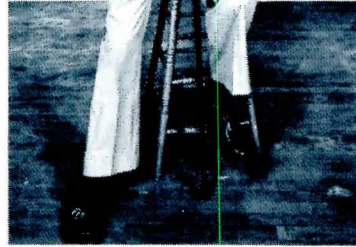


## Form and fantasy in Philadelphia

Currently on view at the Philadelphia Museum of Art through January 8, 1984, "Design Since 1945" is arguably the most important exhibition of contemporary consumer products and decorative arts ever assembled. The show, a collaboration between architect and educator George Nelson (pictured right) and curator Kathryn Hiesinger, reveals the last four decades of mass-produced domestic design as a period of widespread innovation, and the 13,000-square-foot exhibition space is filled to overflowing with objects that represent every recent international design trend, from World War II functionalism to postmodernist ornamentation.

The show opens with three galleries devoted to the display of lighting, furniture (mainly chairs), and textiles. It is here that one encounters the first of seven "mini-stage sets" on selected designers. Significantly, six of the seven featured artists—Charles Eames and Nelson of the United States, Dieter Rams of West Germany, Arne Jacobsen of Denmark, and Marco Zanuso and Ettore Sottsass of Italy—were trained as architects. The seventh is Tapio Wirkkala, the Finnish craftsman. Each of these sets, or "didactic stops" as Nelson calls them, features several objects, along with a chronology and a brief quotation that summarizes each man's distinct philosophy. For example, while Sottsass believes that "design is a way of discussing life... society, politics, eroticism, food, and even design," Rams's goal is "to help limit and reduce the chaos of the world about us." When artists' notions are that far apart, it is small wonder their work is so varied.

Leaving the comfortable confines of home furnishings, one enters a high-ceilinged gallery given over to high-technology products. Sleek televisions, radios, typewriters, cassette recorders, and computers accompanied by some fascinating predecessors are housed within elliptical, floor-to-ceiling pylons. To heighten the experience, the show's organizers have suspended a few large objects overhead: A fiberglass Corvette body relates to the technology used in some nearby chairs, satellites address the current trend toward miniaturization, and a hang-glider demonstrates a combination of ultra-light materials. Nelson refers to this area as "Stonehenge"—a monolithic comment upon the fact that our sophisticated



electronics are used by many who are technologically illiterate. Clearly, the real issue for him is imagination, not technology.

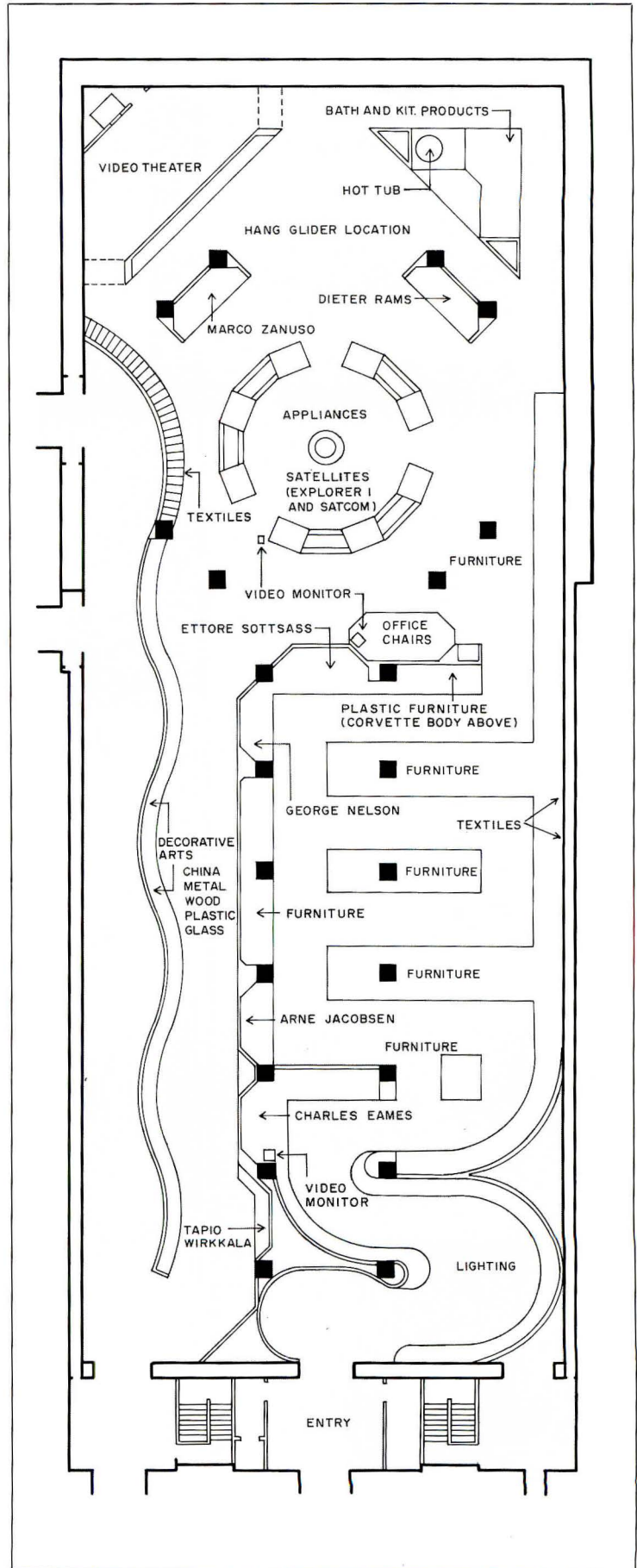
Although Nelson and Hiesinger have made this gallery both the spatial and thematic culmination of the exhibition, the following explosion of glass, ceramics, metalware, and wooden objects displayed in an undulating, 100-foot-long case is hardly an anticlimax. Nevertheless, this profusion of beautiful pieces, while impressive, raises the general question of how the exhibit's planners made their selections. Why, for instance, is there so much seating in the furniture section? Why is there no home exercise equipment, products for children, or innovative designs for sleeping? To include more objects obviously would have made the show cumbersome, but a better balance of domestic design might also have strengthened the over-all message.

No matter. Nelson has staged an exhibit where everyone can find something of interest in a manner that is totally consistent with his lifelong ambition of teaching people how to see. That security guards have been observed zealously reading text and scrutinizing objects is a sign not to be underestimated. A number of items are ones that we have grown up with, seen in catalogs, heard about from friends, or contemplated buying. To view them now, suddenly behind very official-looking museum cases, forces us to ask direct questions of the way design fits into our lives.

In the end "Design Since 1945" is a utopia that designers dream about—a fairy-tale world of all the right things. And yet, the objects, grouped by type, date, and material, tell us that design, far from being a surface embellishment, is in fact a basic human activity directly related to the real world and to such other important concerns as eating, sleeping, and working. It is not, then, just 40 years of history that Nelson helps us to see in Philadelphia; it is also a clear, if highly selective, view of ourselves. *Steven Holt*

1. Floor plan of the exhibition.
2. Robert Heritige, "Pan Parabolic" track lamp, 1973.
3. Paolo Deganello, "Torso" lounge chair, 1982.
4. Nils Landberg, "Tulip" wineglass, 1956.
5. Sori Yanagi, "Butterfly" stool, 1956.
6. Jakob Jensen, "Beogram 4000" turntable, 1972.

7. Eric Magnussen, "Thermo" jug, 1977.
8. Franco Bettonica and Mario Melocchi, Bar set, 1969.
9. Pierre Paulin, Stacking chair, 1967.
10. Mario Bellini, "Praxis 35" electric typewriter, 1981.
11. Livio Castiglioni and Gianfranco Frattini, "Boalum" table lamp, 1971.





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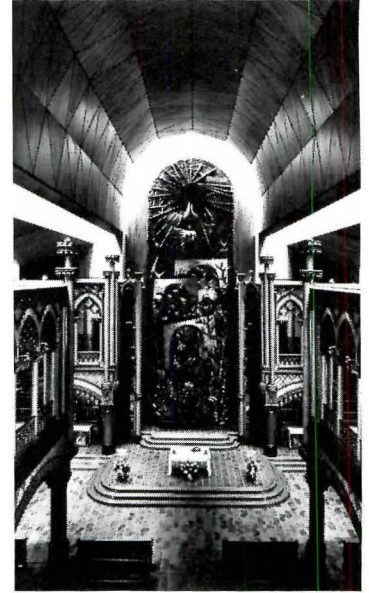
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Royal Architectural Institute of Canada  
Governor-General's Medals for Architecture**



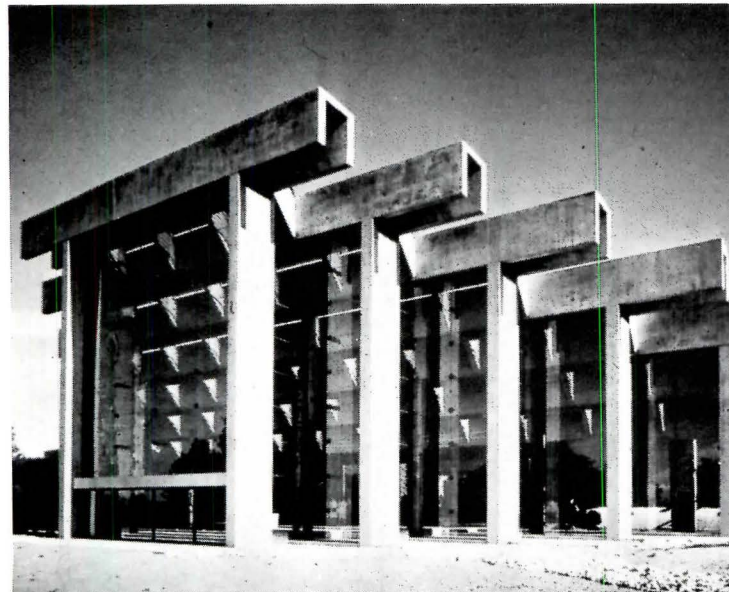
1 James K.M. Cheng



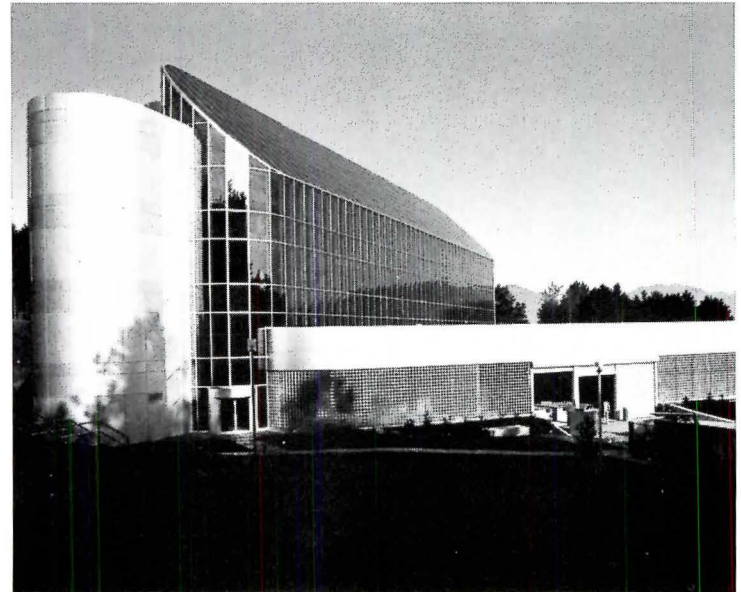
2 Dick Busher



3 Carl Valiquet



4 Simon Scott



5 Simon Scott

**1. Willow Arbor, Willow Court, and Heather Terrace Town Houses, Vancouver, British Columbia;** James K.M. Cheng, Architects. The architects worked with three different developers to produce this unified housing ensemble in a mixed residential/industrial area of Vancouver. The courtyard scheme is meant to encourage social contact, while the siting of the complex is designed to take advantage of views of downtown and the distant mountains. The jury praised such architectural devices as brick gateways, arbors, and arches as details that individualize each dwelling unit.

**2. Ping Pong I, Vancouver, British Columbia;** Bruno Freschi, Architect. Two shops were gutted and the interior volume expanded by means of plexiglass canopies to create this Vancouver gelateria. "A marvelous spoof," noted one juror. "Playful and festive," observed another. "Imaginatively colored historical elements fit in well with the brash context. It is a space that people will enjoy and find memorable."

**3. Chapelle du Sacré-Coeur, Montreal, Quebec;** Jodoïn Lamarre Pratte and Associates, Architects. Largely destroyed by a fire in 1979, this chapel was restored by juxtaposing new elements in wood with ornamental pieces salvaged from the original structure. The jury called the renovation "a contemporary intervention well

combined with the historic basis. By emphasizing intricate detailing, the architects created a tension without harming the unity of the space."

**4. Museum of Anthropology, University of British Columbia, Vancouver, British Columbia;** Arthur Erickson, Architects (see RECORD, May 1977, pages 103-110). This 66,000-square-foot academic museum was conceived as "a metaphor for a Northwest Coast Indian village" and was designed to accommodate large totem poles and other smaller historic artifacts. The jury praised the concrete building for its impressive siting and called it "a remarkable formal structure, unusual for a museum in its generous use of daylighting."

**5. Multi-Tenant Research Building, Discovery Park, Burnaby, British Columbia;** Russell Vandiver, Architects. Four functional zones—research, amenities, circulation, and parking—are incorporated into this aluminum-clad, concrete-reinforced technology center. A triangular plan permits flexibility for tenants requiring between 1,000 and 15,000 square feet of space. The RAIC jurors lauded the facility as "an accomplished statement of high technology" and cited in particular its elegant elevations and dramatic use of color.

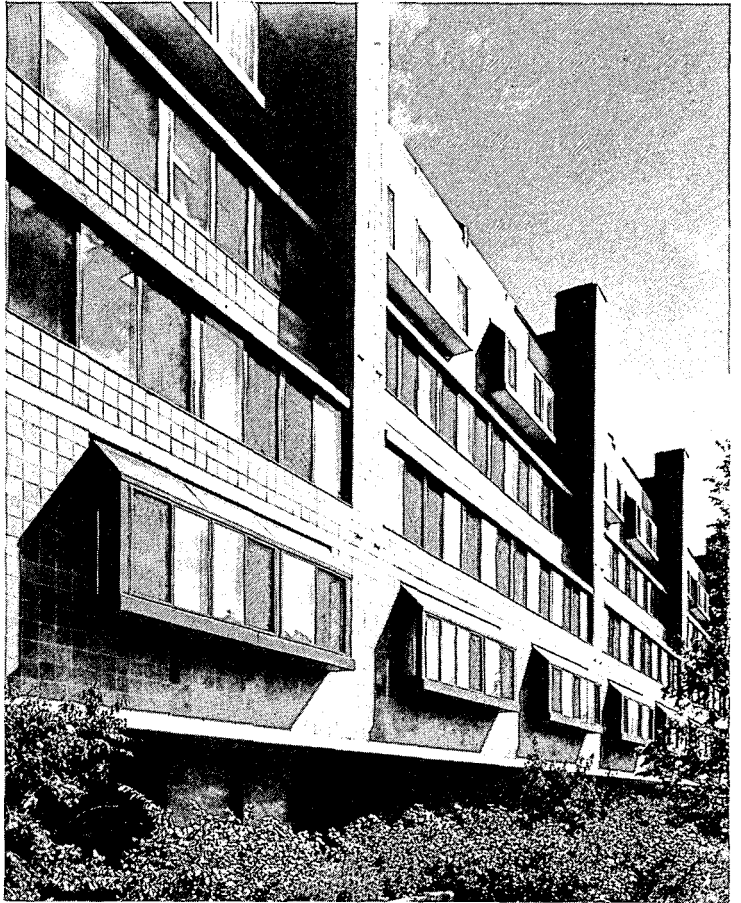


The Royal Architectural Institute of Canada has announced the selection of nine projects to receive its Governor-General's Medals for Architecture, given periodically to recognize outstanding achievement in the field of Canadian architecture. Jurors who reviewed the 98 entries included William Kessler, FAIA, partner in William Kessler & Associates of Detroit; Jean-Marie Roy, FRAIC, partner in Gautier, Gité, Roy, Architects of Quebec City; and Eberhard H. Zeidler, FRAIC, partner in Zeidler Roberts Partnership/Architects of Toronto.

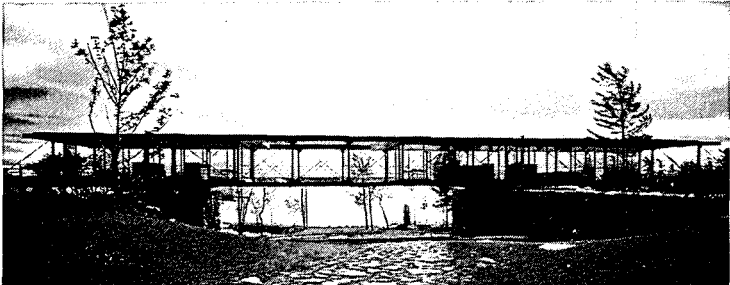
Awards news continues on pages 66-67 with the twenty-first annual Prestressed Concrete Institute Awards Program.



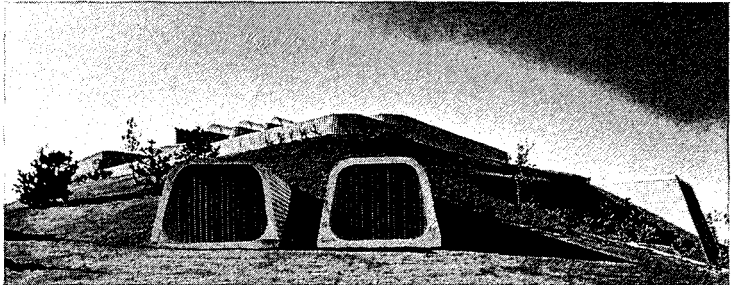
6 Fiona Spalding-Smith



7 Robert Perron



8



9 Louis Perron

**6. NOVA Corporate Headquarters, Calgary, Alberta;** J.H. Cook, Architects. "A sophisticated approach to the typical problems of the urban high-rise" is how the awards jury characterized this corporate structure located on the western edge of downtown Calgary. The project comprises a 37-story office tower clad in stainless steel, a glazed lobby/garden at the tower's base, and a three-story service building, connected by a pedestrian bridge across Seventh Avenue, housing corporate training facilities, a cafeteria, and an auditorium.

**7. The Oaklands Condominiums and Town Houses, Toronto, Ontario;** DuBois Plumb & Associates, Architects. A 50-foot area height restriction and the architects' desire for contextual harmony with the detached and semidetached dwellings of the surrounding neighborhood dictated the midrise configuration of this four-story housing complex. Eight-inch by eight-inch bricks, bay windows, and a row of chimneys along the street facade contribute a domestic feeling to the project, which consists of 51 apartments, nine professional suites, and eight town houses. Access to the individual residences is via an interior skylighted street—a design element that the RAIC jury praised.

**8. Wandich House, Peterborough, Ontario;** Jim Strasman, Architects (see RECORD, mid-May 1983, pages 138-143). "A powerful dramatic statement, a tour-de-force," proclaimed the jury regarding this year-round lakeside retreat. In order to intrude on the landscape as little as possible, the architect placed two virtually transparent glass boxes atop a 170-foot-long deck that cantilevers out 50 feet over the lake. Granite-clad concrete berms beneath the deck provide privacy for the dwelling's bedrooms.

**9. Water Pumping Station, Longueuil, Quebec;** Boudrias, Boudreau, St. Jean, Architects. This municipal water plant was designed to pump 109 million gallons a day from the St. Lawrence River into reservoirs serving four cities near Montreal. Environmental considerations and the fact that little natural light was needed led to the placement of the precast concrete facility largely below grade. The jury called the structure "a powerful sculptural mass and a solution of unusually high quality for a utilities building."



# Prestressed Concrete Institute Awards



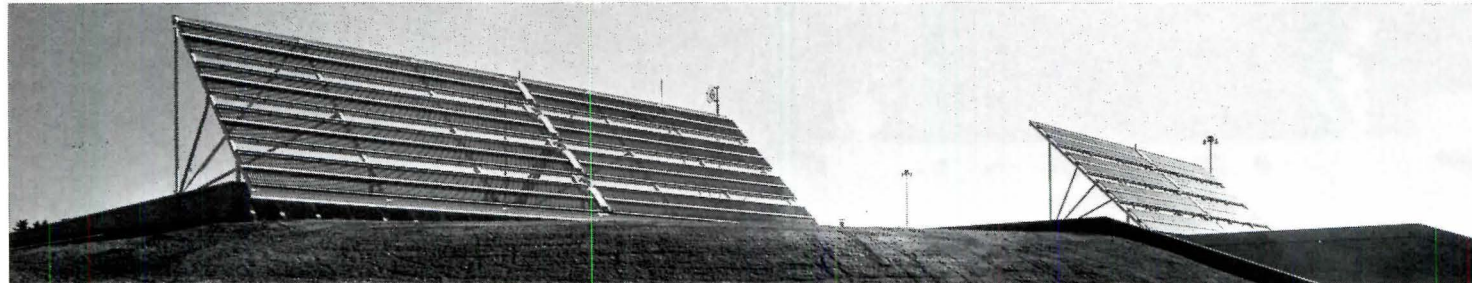
1 Sam Sweezy



2 Antoine Predock



3 Daniel Hartzenbeuhler



4 R. Greg Hursley

Architects and engineers of seven buildings and six bridges received recognition for their esthetic, functional, and economical application of precast prestressed concrete in the 1983 PCI awards program. We show a representative selection of winning structures cited by jurors Robert Broshar, FAIA, partner in Thorson/Brom/Broshar/Snyder, Architects; Thomas H. Beeby, AIA, partner in Hammond, Beeby & Babka; Walter Podolny, Jr., Bridge Division, U.S. Department of Transportation; Macy DuBois, FRAIC, president of the Royal Architectural Institute of Canada; and John H. Wiedeman, president of the American Society of Civil Engineers.

**1. The Westin Hotel, Boston, Massachusetts;** The Architects Collaborative, Architects. Cornerstone of the mixed-use Copley Place urban development project, this 36-story hotel is clad in 1,374 rusticated precast concrete panels that were selected to blend with the historic masonry architecture of the surrounding Back Bay neighborhood. The jury lauded the hotel for its texture, scale, and refined detailing.

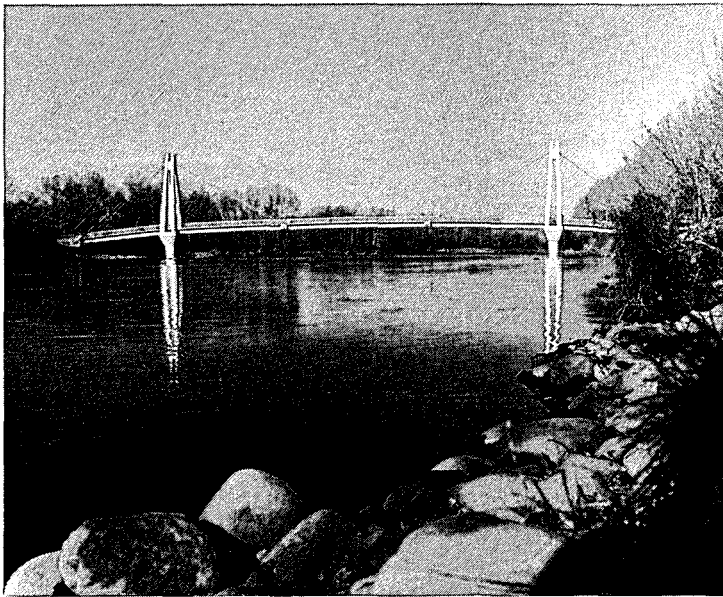
**2. St. Bernard Condominiums, Taos, New Mexico;** Antoine Predock, FAIA, Architect. Speed of construction and thermal storage capacity dictated the use of plant-manufactured precast concrete for this condominium project located at the base of the ski slopes near Taos. The jurors noted that the facade's neutral hue and the over-all massing of

the complex harmonize with surrounding cliff formations and enhance the natural character of the mountain site.

**3. Blue Cross and Blue Shield of Texas, Richardson, Texas;** Omniplan, Architects. Massive 60-ton concrete bents were used on this regional headquarters building to resist lateral and gravity loads as well as to create a strong architectural presence. "A well-done, honest expression," noted the PCI jurors. "The structure is the building."

**4. Multnomah County Maintenance and Operations Facility, Portland, Oregon;** Zimmer Gunsul Frasca Partnership, Architects. Located on a 90-acre landfill site that the county has begun to reclaim, this 186,000-square-foot vehicle maintenance and storage facility was placed substantially below grade to minimize its visual impact in an area of existing and proposed housing. Solar panels on the south side of a hollow-core slab roof provide nearly all the facility's air-conditioning needs and about half of its heating and hot-water requirements. "An interesting and convincing solution to a difficult challenge," observed the jury.

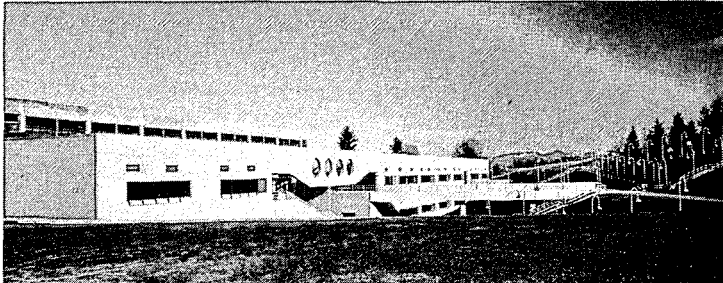




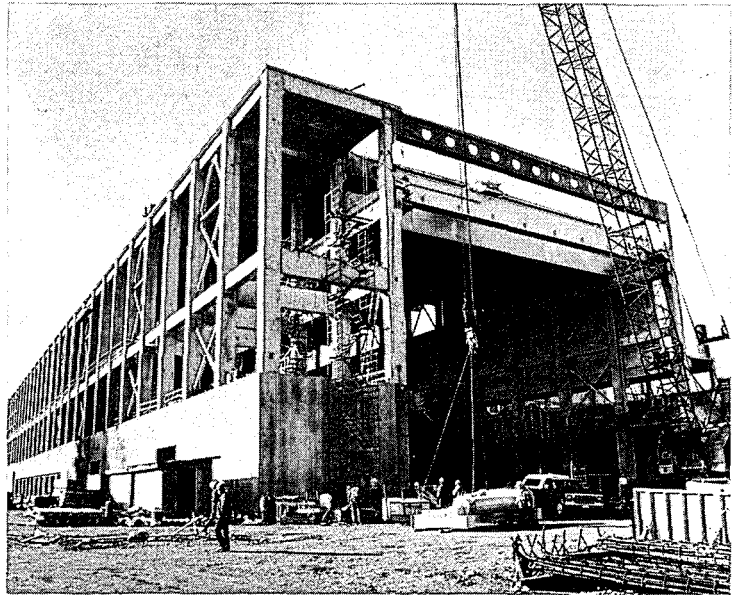
5 *Simpson Lester Goodrich*



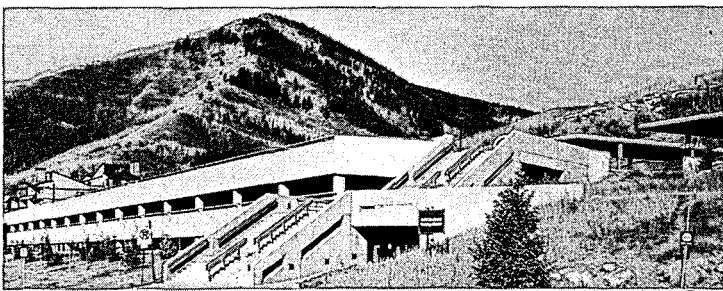
6 *Ray Stanyard*



7 *Bruce Surber*



9



8 *James Ream*

**5. Eric Harvie Pedestrian Bridge, Calgary, Alberta;** Simpson Lester Goodrich, Engineers; Graham McCourt, Architects. Four tapered concrete columns form each of two towers for this distinctive pedestrian bridge in a city park. The cable-stayed structure has a central span of 263 feet and two side spans of 66 feet with a deck composed of five precast, pretensioned T-shaped box girders. "A cheerful and spirited crossing in a romantic setting," observed the jurors.

**6. Linn Cove Viaduct, Linville, North Carolina;** Figg and Muller, Engineers. This 1,234-foot-long, S-shaped viaduct is a post-tensioned, precast segmental concrete bridge constructed by progressive placement in one-directional cantilever. Located in an


ecologically sensitive area of the Blue Ridge Mountains that features rough, wooded terrain and extensive rock outcroppings, the bridge is, in the words of the PCI jury, "bold and imaginative engineering in response to preserving a beautiful environment."

**7. Lake Washington Vocational Technical Institute, Kirkland, Washington;** Cummings Schlatter Associates, Architects. This public secondary school near Seattle exhibits precast concrete application in its weathering surfaces, structural system, and interior finishes. Prestressed concrete framing allows the long spans and flexible open spaces needed for changing classroom and shop requirements.

**8. Vail Lionshead Parking Center, Vail, Colorado;** Robbins & Ream, Architects. Designing a parking facility for 1,135 cars while preserving the small-town ambience of this winter resort was the challenge faced by the architects. Their solution of a partially underground, prestressed concrete structure combined with landscaped berms and plazas was praised by the PCI jury for its sensitivity to the environment.

**9. Number Five Newsprint Machine Building, British Columbia, Canada;** Swan Wooster Company, Structural Engineers. Precast and prestressed concrete components were selected to meet a tight construction schedule (31 weeks from engineering to erection) and to produce a finished building that could withstand the high temperature and humidity resulting from paper-mill operations inside. The structure was designed to support the weight of one 54-ton reel crane and two 82-ton overhead cranes. "Simplicity gives [the building] monumentality," noted the jury.





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# Growing in

Perhaps the most telling point to be made about the educational buildings gathered here under the rough rubric "campus infill" is that such a collection could be assembled at all. That it could—and that the small sampling shown only hints at the wealth of similarly exemplary projects on architects' boards and on campuses around the country—suggests both a shift in the approach of designers to campus buildings and a change in attitude and priorities on the part of educational clients. It also reflects what might be called a positive conservatism that owes as much to a renewed awareness of values obscured in the headlong race for expansion produced by the post-war baby boom as it owes to the unyielding realities of enrollments (for most colleges stable or declining), costs (rising), and resources (budgets, shrinking; buildings, aging).

In the heady days of unbridled and unabashed expansionism new college facilities leapfrogged established campus centers, huddled uncomfortably in nebulously defined zones, rudely jostled—or as rudely ignored—elderly neighbors, often with little regard for the coherence and integrity of building ensembles that at a slower pace of development had been notable examples of large-scale architectural composition. Given the current breathing space between waves of students, however, many institutions are again recognizing that more is not enough and are looking backward to lost amenities as well as forward to new programs and new teaching techniques.

In this they are abetted by a newly modest mood within the architectural community, which encourages the perception of new campus buildings as contributory elements in an organic whole rather than as independent statements—a perception that flows naturally to a like concern with siting added elements in such a way as to reinforce the existing campus fabric. As the term "campus infill" suggests both continuity and contiguity, so the implied use of "leftover" space leads to an emphasis on organizing the voids—open space, vistas, exterior circulation paths—delineated by new building volumes.

Although the over-riding theme is integrative rather than merely additive, it is often expressed through simple addition in the sense that the impulse toward restoring (or creating) a well-composed milieu is accompanied by a renewed appreciation of the potential stored in older buildings whose reuse can at once limit the need for new construction and maintain the integrity of the campus as an organism receptive to growth as well as expansion. *Margaret Gaskie*



# Revivalism at Rice

Seeley G. Mudd Computer  
Science Laboratory  
Rice University  
Houston, Texas  
Charles Tapley Associates,  
Architects



The formal introduction to the Rice University campus is a near-theatrical progression along a grand allee overhung by live oaks whose canopy parts to disclose across a fore-stage of acid-green lawn the stunningly exuberant, curiously buoyant backdrop of Lovett Hall, the university's first building and still its centerpiece. Beyond, through Lovett's lofty central sallyport, lie (albeit truncated overtime) the great academic court, successive cross axes, and skillfully orchestrated greens and malls of Cram, Goodhue and Ferguson's 1910 master plan, delineated by buildings in the highly eclectic Mediterranean style Ralph Adams Cram devised to suit at once the high purpose of the new institute and Houston's steamy climate and tabletop terrain.

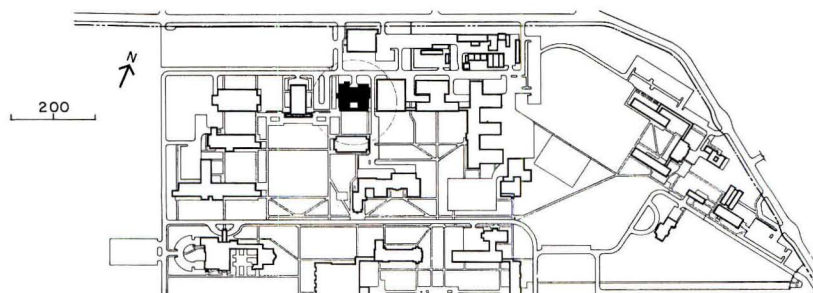
Cram characterized the original buildings as having elements of "Syrian, Constantinian, Byzantine, Lombard, Dalmatian, French, Italian and Spanish Romanesque with a covert glance at the Moorish art of North Africa," and other early campus additions, though less ebullient, partake of the same themes.

Later development, however, coincided with the waning of eclecticism and the waxing of modernism, until by 1961 the vintage "Rice style" could be dismissed as "a shotgun marriage between Venice and Valladolid." More damagingly, this attitude of disdain has been increasingly reflected in the siting as well as the design of recent buildings, resulting in an uneven congeries that gestures but weakly to the original campus plan and its once-cohesive architecture.

So it was with some temerity that architect Charles Tapley construed the commission to design a 27,000-square-foot computer science laboratory for a tight site at the "side door" of the campus as an opportunity to contribute to the reweaving of the frayed master plan as well as to recapture in the new structure a distillation of the traditional Rice style.

In pursuit of the former aim, the laboratory opposes its facade to the building on the south so that the two sketch a small quadrangle flanked by more expansive open spaces, an organizing device reminiscent of the early campus. In addition, the building turns the corner so as to emphasize its side entrance, lending definition to the "waste" space of an adjacent auto court.

The distillate style of the building is most evident in the arcade that extends the cloisters of the original mechanical lab and an adjoining laboratory to the east. However, to obviate the potential monotony of the continuous arcade and distance the Mudd laboratory from the building opposite, the upper story is stepped back and the arcade opened to an entry court. The staged sequence of spaces leading to and through the building culminates in a central stairwell capped by a projecting lantern that vertically expresses the transept and recalls the towers and tabernacles that punctuate many of Rice's older buildings. The Mudd laboratory's chunky blocks, gable roofs, arched windows, patterned masonry, and stylized details also speak with appreciation of the like elements of its early predecessors. And if the building seems a "soft" housing for a hard science, so were the Mediterranean fantasies first woven for the William Marsh Rice Institute. Ralph Adams Cram would be gratified.



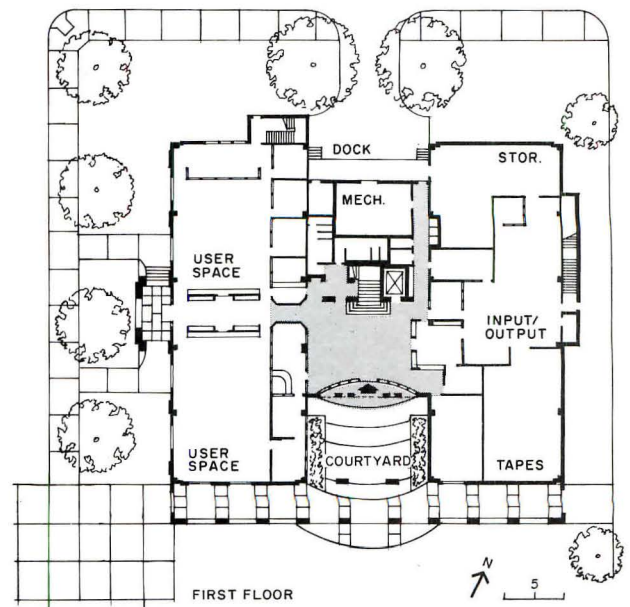






Reflecting its use as both a teaching center for students and a research and applications facility serving the city as a whole, the Seeley G. Mudd computer science laboratory is organized in two wings—one for people, one for machines—joined by a mechanical core and public circulation space. The west wing contains a large user workroom, designed to resemble a library reading room, at ground level; on

the floor above, private offices for staff are grouped around common work areas. An elaborated side porch provides convenient entry from the student parking lot. In the east wing the ground floor houses plotters, printers, and tape storage, while the upper level is given over to computers that require little attention and, as Tapley says, "may be left to hum in the dark."

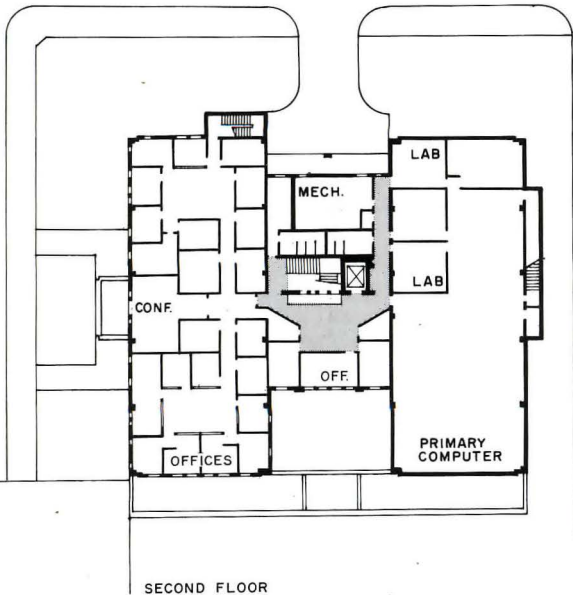
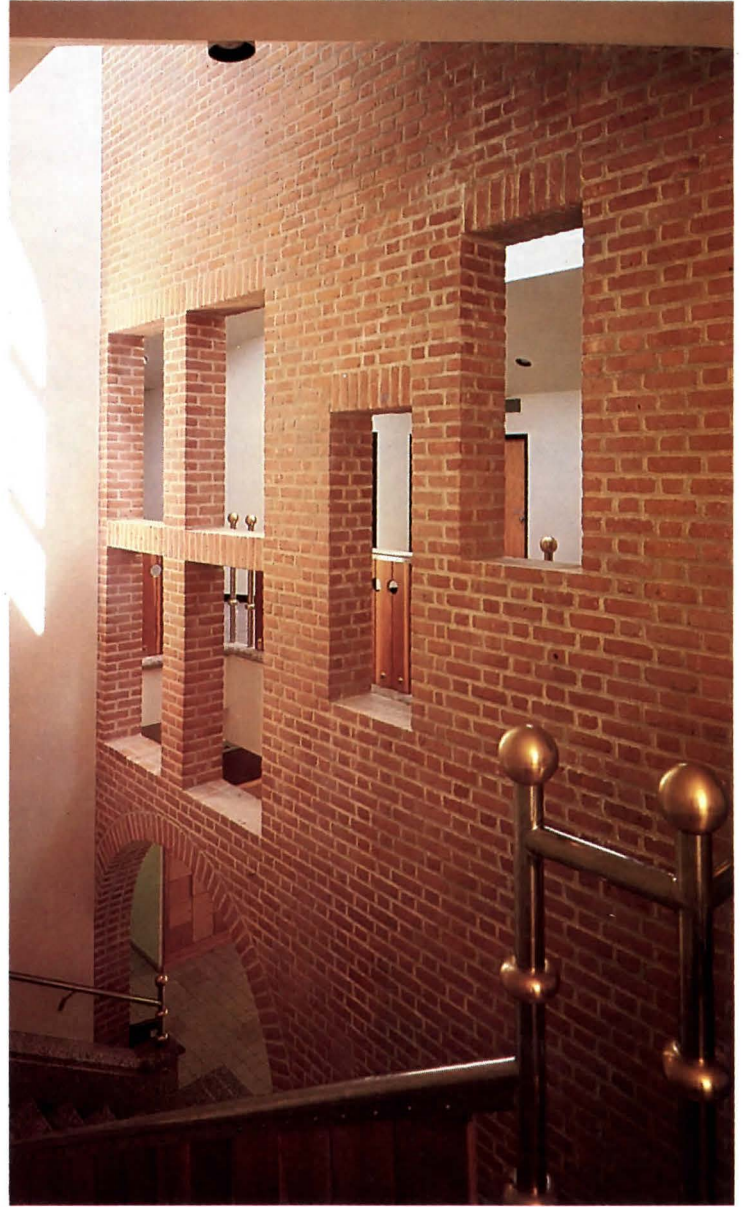




Public access is a planned movement from arcade to entry court to building lobby, where a pierced freestanding brick wall arcs over an imposing central stair and rises to the large clerestory lantern above the second-floor reception area. To allow light from the lantern (which is designed to admit winter sun while blocking strong summer rays) to wash the wall below, the floor of the reception

area is pulled back from the stairwell to form a balcony (photo below). According to the architect, the lantern-wall-stair combination is an attempt to open visual and physical communication between the first and second floors while highlighting from inside and out the public area of a building that otherwise has many levels of secure access. The introduction of the masonry wall and such details as

the medieval-flavored brass newel posts and balustrade of the stair and the careful manipulation of light are deliberate ploys to bring warmth to a building dedicated to the cool science of the computer.











Although architect Charles Tapley sought, he says, to avoid the "temptation to richness," the exterior detailing of the Mudd laboratory is nonetheless rich in reminders of the early Rice buildings rendered in simplified form. Typical examples are the extrados moldings of the arches fronting the entry arcade and the side porch, and the clean balustrade and alternating bands of limestone and milk-chocolate brick that emphasize the latter (photo opposite), as well as the layered masonry walls and the arched ground-floor windows topped by thin second-story windows. At the main entry, however, the building is clearly positioned in time by the contemporary gesture of a broad metal-framed window wall.



*Seeley G. Mudd Computer Science Laboratory  
Rice University  
Houston, Texas*

**Owner:**

*William Marsh Rice University*

**Architects:**

*Charles Tapley Associates, Inc. — Charles Tapley, partner-in-charge; Dean A. Johns, project architect*

**Engineers:**

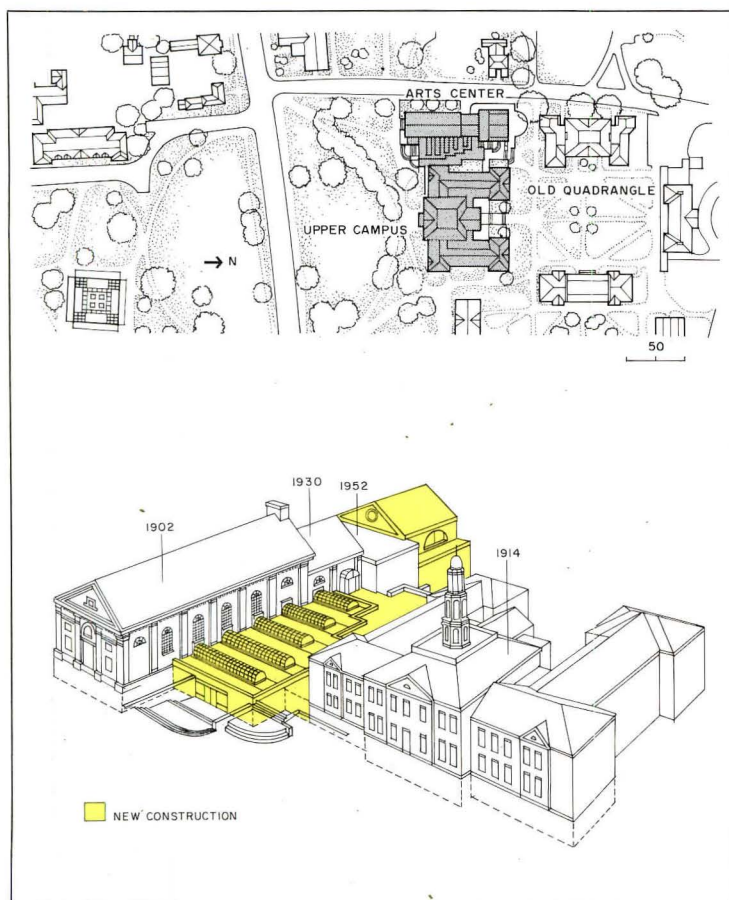
*Walter P. Moore & Associates, Inc. (structural); Grunewald Engineering, Inc. (MEP)*

**General contractor:**

*Paisan Construction Company*



## A buried treasure



Though not the largest or most generously endowed of the prep schools along the St. Grottlesex axis, Phillips Exeter Academy has over the past 20 years assembled around the core of a picture-postcard New England campus replete with well-wrought Georgian Revival buildings framing tree-studded greens, a remarkable compendium of the architecture of the period. Louis Kahn's 1971 library is world-renowned. The near-contemporaneous New Brutalist gymnasium by Kallmann & McKinnell and the later high-tech theater by Hardy Holzmann Pfeiffer are outstanding examples of their genres. Other recent buildings, if lacking the star quality of these, are more than competent in their supporting roles.

Yet when the school decided in 1979 to consolidate its offerings in the visual arts, then scattered in makeshift quarters in five widely separated buildings, into a single complex—a clear invitation to add yet another architectural showpiece to its collection—Exeter chose instead to explore the possibility of accommodating the proposed arts center in an existing building.

The nominee was Lamont Hall, built in 1902 as a dining commons but converted in the '50s to house an art gallery and, in two additions, painting and drawing studios. Already closely identified with the arts, Lamont also enjoyed proximity to the theater and music building as well as the lure of a popular basement snack bar. Its generous height invited the insertion of new studios. What the building lacked was enough space to encompass the ambitious arts program envisioned.

Although additional space could be (and was) reclaimed from the under-used basement of the neighboring Academy Building, which included among its assets a cavernous firing range, the need for some new construction—particularly to meet the demanding technical and spatial requirements of the art gallery—was obvious. Less obvious was a suitable site in the densely built vicinity of Lamont Hall and the Academy Building. And obvious only after the fact was architect Amsler Hagenah MacLean's ingenious placement of the new gallery on a "found" site carved out between the two older structures.

The one-story gallery joins its neighbors at their lowest levels, leaving their handsome period facades unobscured in a gesture of respect most eloquent at the main entrance, which, tucked below grade, is retiring to the verge of invisibility. On the north the sloping site carries the building to grade, where it debouches onto the campus's Old Quadrangle, preserving a time-honored path from the students' dormitories to their mailboxes on the Upper Campus, with the refurbished Lamont grill en route, and thus assuring at least a passing audience for the gallery's wares. The interior path, however, meets strong competition from its alternate, an exhilarating sweep of outdoor stairs and terraces that climbs to a paved and planted rooftop plaza where barrel-vaulted skylights demark the bays of the gallery below.

As much landscape as building and as much renewed as new, the Mayer Art Center shuns the bravura of its peers among the Exeter collection but voices no less persuasively the values of its time—a time, it seems, for solo to yield to ensemble.





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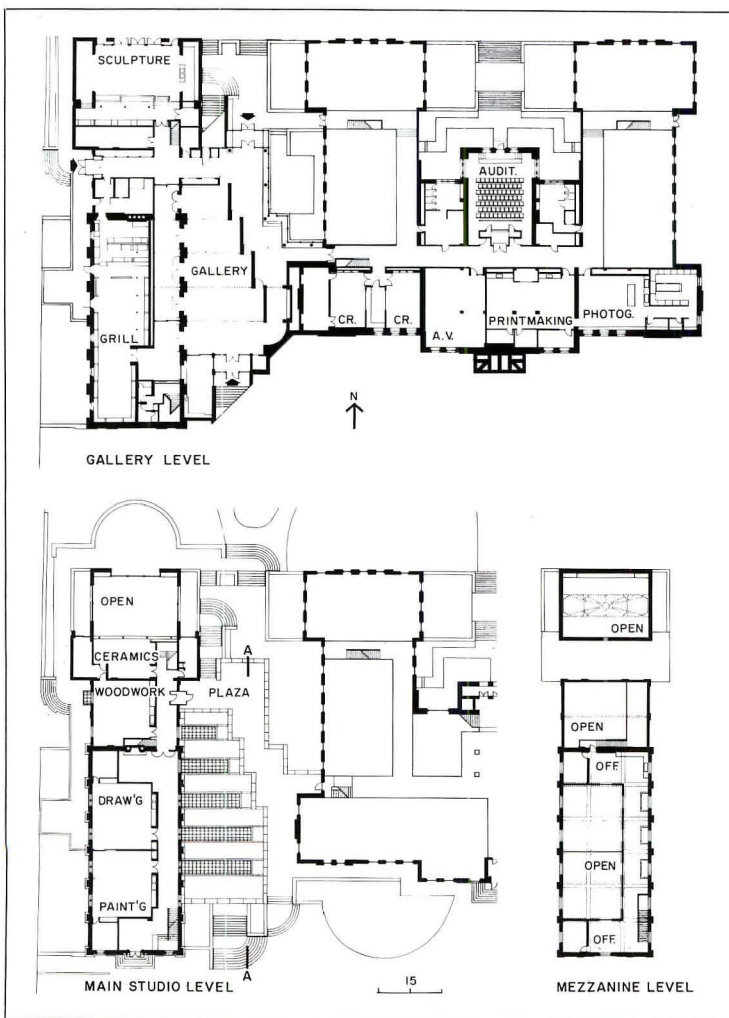
*Apart from the art gallery, the integration of Exeter's visual arts programs into a unified complex required no new construction except a two-story sculpture studio (photo top opposite and right in photo above), the third addition to Lamont Hall. The gabled studio lends balancing height to the composition of the center and recalls with sympathy the details of the original building, though here*

*the marble banding is rendered in taut flat planes, window arches become bold half circles, and a full-height window wall lends the addition a decidedly nonperiod openness. To disguise the over-width box of the 1952 addition and mediate the drop in grade, the studio is flanked by one-story wings. From the south the unobtrusive below-grade gallery entrance (photo top) preserves the*

*dominance of the older buildings and the landscaped plaza between them, while on the north the plaza spills downward in a cascade of stairs and terraces.*



With a craft worthy of a Chinese puzzle, every available inch of space in the two existing buildings was turned to use to support the arts program centered in the new complex. The cramped warren of the Academy basement yielded upgraded facilities for art history (including an 80-seat auditorium), printmaking, film, and photography, while the generous spaces of Lamont and its additions readily lent themselves to renovation as commodious studios for painting, drawing, architecture, woodworking, and ceramics, supplemented by the new sculpture studio. Handsomely refurbished, the campus grill retained its time-honored place in Lamont's basement, now the gallery level. In the original dining hall, which is shared by the painting and drawing studios, the removal of a dropped ceiling hung when the space was converted to a gallery revealed a richly molded 25-foot-high coffered ceiling and not incidentally permitted the insertion of a mezzanine level along the east wall (photo right). Designated as the architecture studio, this aerie was carefully planned not only to preserve the continuity of the coffered ceiling but to retain the balance of the opposing arched windows on either side of the building. The wall separating the mezzanine from the studios is fully glazed above solid half-height partitions that alternate with large glass panes set in direct line with the windows. At the outside wall, the mezzanine floor is held back at each window, forming a reverse balcony overlooking the main-level gallery corridor below.



Frederick R. Mayer Art Center  
Phillips Exeter Academy  
Exeter, New Hampshire

**Owner:**

Phillips Exeter Academy

**Architects:**

Amsler Hagenah MacLean,  
Architects Inc.

**Engineers:**

Brown, Rona, Inc. (structural);  
Fitzmeyer & Tocci, Inc.  
(mechanical); Herosy Associates,  
Inc. (electrical)

**Consultants:**

Jules G. Horton Lighting Design,  
Inc. (lighting); Sasaki Associates,  
Inc. (landscape); Todisco Associates,  
Inc. (specifications)

**General contractor:**

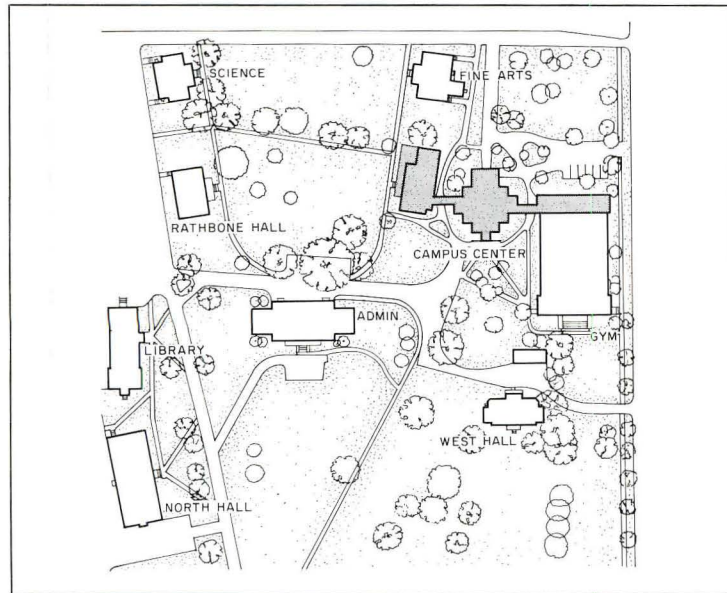
Davison Construction Company







# Multiplication by addition



*Albany Campus Center*  
Russell Sage College  
Albany, New York  
**Owner:**  
Russell Sage College  
**Architects:**  
Architectural Resources Cambridge,  
Inc.—Colin L.M. Smith, Joseph  
Maybank, James F. Davies,  
principals-in-charge; William  
Simmers, Robert Zverina, Been Zen  
Wang, project team; Lynda Lloy  
Hack, interiors

**Engineers:**  
John Born (structural); BR+A  
Consulting Engineers, Inc.  
(mechanical/electrical)  
**Consultants:**  
Carol R. Johnson and Associates  
(landscape); James E. Gui  
(specifications)  
**Construction manager:**  
Duncan and Cahill

When Russell Sage College decided to branch out from its home base in Troy, New York to establish an urban satellite in nearby Albany, it acquired for the purpose a contradictorily bucolic ready-made campus that began life around the turn of the century as a children's home—a sylvan retreat dotted with porticoed, rosy-brick-clad dormitory cottages.

Readily converted to academic spaces, the cottages for a time comfortably housed the new institution's heterogeneous student body and varied menu of full-time, part-time, and evening courses largely without benefit of new construction, the most conspicuous exception being a gymnasium that fast devolved to an under-used "gray elephant." Expanding enrollments and more ambitious outreach programs, however, soon built a demand not only for more classrooms but also for conference facilities to serve both college and local community, and for new accommodations to replace an ad hoc student center that met neither the students' needs nor the state's building code.

To resolve the mismatch between the college's program and its purse, Architectural Resources Cambridge vectored a course combining new construction with renovation. The existing student center was remodeled to provide classrooms and student activities areas, while two levels of offices and meeting rooms for the school's active evening division were slotted into the gymnasium's rarely used stage area. Linking the two existing structures is a three-story addition in which bookstore, rathskellar, dining hall, and conference facilities are adroitly connected by stepped platforms (photo below) that interweave vertical circulation and lobby space with intimate lounge areas, and smoothly reconcile the differing levels and circulation patterns of the adjoining buildings. The sawtooth profile of the facade, with its generously glazed stepped bays, affords continuity of scale and, by revealing the building's interior spatial and structural organization, affirms its character as a bridge between the former student center at the heart of the campus and the gymnasium at its fringe.

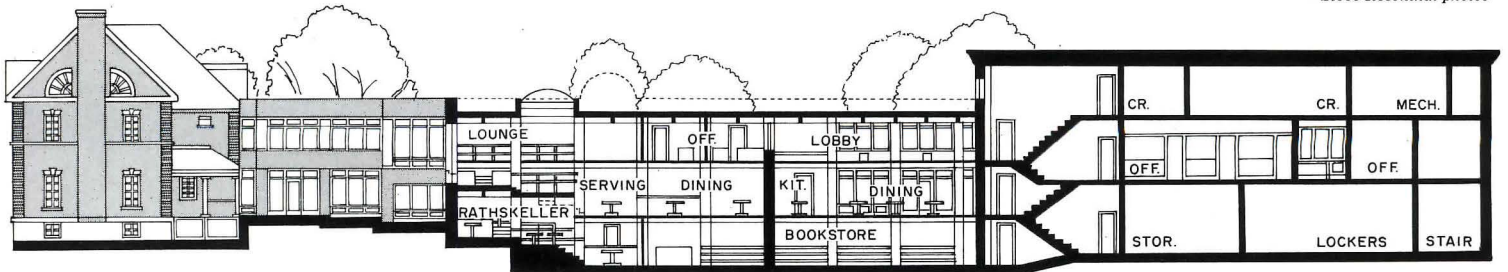
The new "campus center" is just that, to the extent it tilts the balance of the campus from the original nucleus of a horseshoe-shaped commons loosely outlined by scattered cottages to a more tautly composed (though still informal) secondary core. It is perhaps suggestive that the arched pediment above the main entry to the new building was designed to mount a clock—the traditional symbol of campus centrality.







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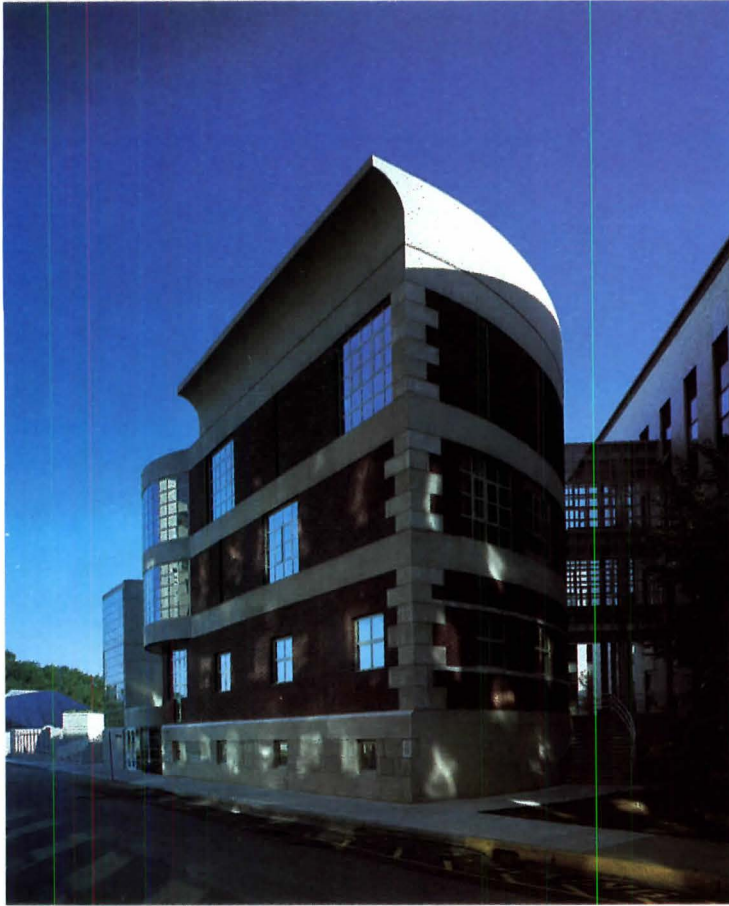
RENOVATED STUDENT CENTER

NEW CAMPUS CENTER

RENOVATED EVENING DIVISION



## A pivotal placemaker



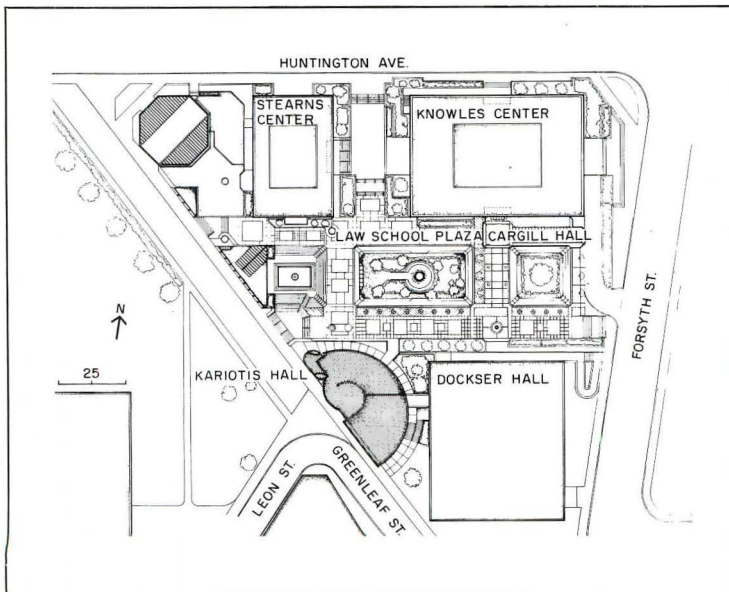
Gertrude Stein was recalling Oakland when she pronounced “there is no there there,” but the observation aptly describes Northeastern University’s sprawling inner-Boston campus, an inchoate aggregation of ponderous neo-neoclassical white-brick edifices set down to no apparent plan and, save for parking lots, all but bereft of open space. Noting the shortfall, architect Herbert Newman sought, in a competition-winning scheme for an expansion of the law school, to avoid further encroachment by conventional construction and to establish a coherent campus focal point by burrowing the addition below grade and crowning it with a handsomely landscaped plaza.

Because the creation of the plaza entailed the demolition of a 19th-century classroom building (once a morgue), the university required the replacement of the lost classrooms with a four-story infill structure to accommodate 500 students in lecture spaces seating from eight to seventy. Commissioned to design this replacement building as well, Newman found that in presenting the university with its first significant pedestrian space he had presented himself with a difficult, if self-created, site on a cramped half-acre wedged between the plaza and the adjacent Dockser Hall, to which the new Kariotis Hall was to be joined.

The stingy triangular plot, however, was important in disproportion to its size. It lies at the confluence of several major circulation routes and visual axes and acts as a bridge between the pallid buildings to the east and a 19th-century warehouse recently renovated for university offices, which Newman considers to be the strongest and most interesting structure on campus—and perhaps a harbinger of future development. Accordingly, the architects worked to a self-imposed program that goes well beyond the modest functional requirements prescribed by the university to address broader issues of context and urban planning.

The half-circle plan of Kariotis Hall, for example, not only lends itself to appropriately pie-shaped lecture rooms but also pulls the structure away from the neighboring Dockser Hall to avoid blocking light and ventilation between the two and to emphasize the path around the building to the plaza. The shallow curve on the north, with the latticed bridge to Dockser, subtly completes the plaza “wall.” On the diameter opposite the office building, Newman’s concern was to relate Kariotis to the old warehouse and to reinforce the embryonic street between by such devices as the ashlar concrete coping, the strong horizontal banding, and the bold overhanging cornice. At the same time, the facade steps down to the north and increases in transparency to modulate the transition from building to plaza.

The projecting glazed curves at lobby and stairwell, which refer to the ubiquitous bay windows of the surrounding Back Bay district, knit Kariotis to its larger urban context and substitute for the absent open spaces vistas along the plaza and converging streets, including a view culminating at Boston’s distinguished Museum of Fine Arts. Not least, Kariotis Hall stands as a free sculptural object that celebrates both its own form and the welcome void of the law school plaza it bounds.





Kariotis Hall  
Northeastern University  
Boston, Massachusetts  
Herbert S. Newman Associates, Architects



©Nick Wheeler photos

*In its complexity—and occasional conflict—of form and material the facade of the street-facing diameter of Kariotis Hall (above and opposite) reflects the multiple roles imposed on the building by its pivotal position on campus. The insistent horizontals of coping, banding, and cornice reinforce the street and, with the corner quoining*

*and rustication, relate directly to the old warehouse opposite, while the building's height, brickwork, and intersecting bays recall the typical Back Bay streetscape.*



*By stepping down and opening outward as it approaches the adjoining plaza, Kariotis Hall deftly mediates the transition between building and open space at the same time that its curving north wall lends definition to the plaza boundary. From within, the lattice-glazed open stairwell and the lobby bay (photo at bottom) offer views along the circulation routes at whose confluence the building*

*stands and around to the sweep of the plaza. From without, along the same visual axes, the transparent bays played against the building's ruddy, white-banded masonry mass contribute to the perception of Kariotis Hall as a distinct sculptural form celebrating the entry to the plaza.*





Kariotis Hall  
Northeastern University  
Boston, Massachusetts

**Owner**  
Northeastern University

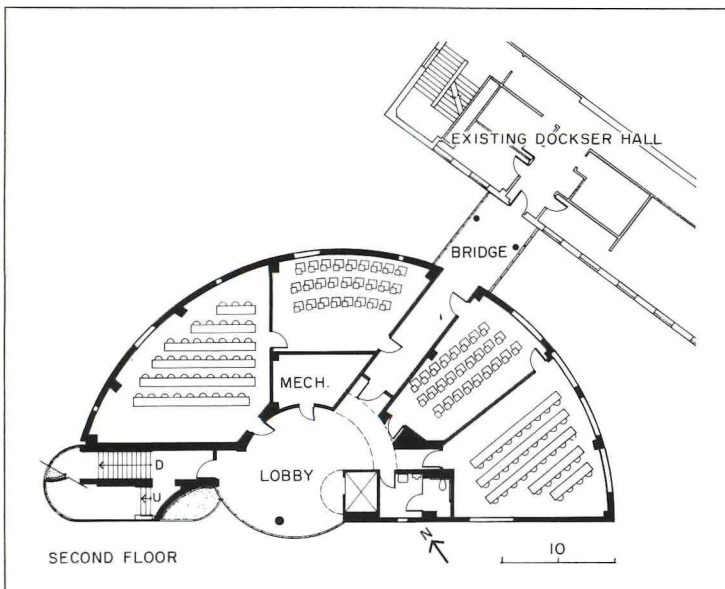
**Architects:**  
Herbert S. Newman Associates—  
Herbert S. Newman, architect-in-  
charge; William P. Newhall, project  
manager; Carl H. Wies, Michael  
Raso, Leonard Hall, John Boecker,  
project team; Herbert S. Newman,

William P. Newhall, Kathy Kuryla,  
Suzanne Greenbaum, interiors

**Engineers:**  
Sippican Consultants International,  
Inc. (structural, mechanical,  
electrical); McPhail Associates, Inc.  
(geotechnical)

**Consultant:**  
Peter Rolland & Associates  
(landscape)

**General contractor:**  
James J. Welch & Co., Inc.





# Form and figure





The Portland Museum of Art  
Charles Shipman Payson Building  
Portland, Maine  
I.M. Pei & Partners, Architects



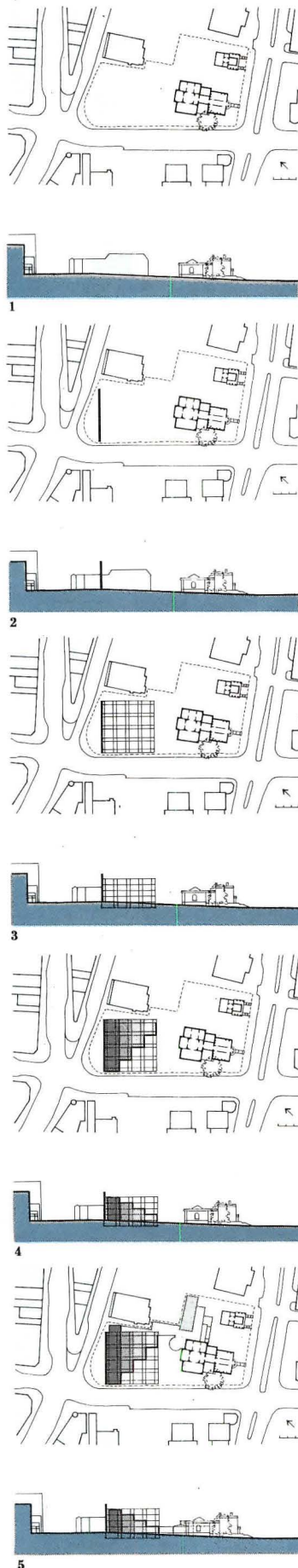


The City of Portland, Maine, now has a splendid new public space. Congress Square, at the intersection of three streets, had long been open space downtown, but its edges were random, gaping and discontinuous. When the trustees of the Portland Museum of Art decided to build a new wing at the rear of the three landmark buildings, which comprised the museum precinct, they presented themselves with the opportunity of making something of Congress Square.

Their new building, designed by architect Henry Nichols Cobb, one of the three founding partners of the I.M. Pei firm, boldly confronts the square, yet quietly accedes to the primacy of the three landmark structures to the rear. Cobb, in determining the height and width of the brick front, considered its effect as the termination of several vistas and decided that it needed to be as wide as the site would allow, and in reasonable scale with the heights of buildings nearby. The final facade proportions are an aggregate of the dimensions of the building's basic gallery module, 20- by 20- by 11.5-foot-high spaces enclosed on four sides by circulation components 20 by 6 by 10 feet high. The facade is backed by 16 of these modules, four across and four high. As the building recedes toward the rear it loses one module of width and one of height, bay by bay.

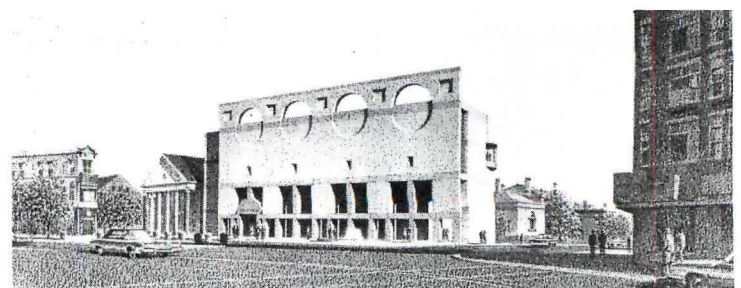
The circles and half circles are figurative metaphors that recall the system of squares in the plan, and the rectangular insets signify the circulation modules. The positioning of the figurative elements of the facade defines the vertical proportions of the module as well. Cobb reports that he has been accused more than once of giving the museum a false front. This wall, however, since it contains the code of the entire proportional system of the structure, can be said to be true to the building.

The museum's permanent collections, which include 17 paintings and watercolors by Winslow Homer, are so diverse as to require a variety of settings and intensities of light to celebrate their content and scale. The aggregation of modules offers a variety of interior spaces: long and narrow on the top floor (four modules long, one wide), picking up another three modules one floor down, then another two, and on the ground floor the full complement of ten. Ceiling heights vary from bay to bay. The visitor experiences skylit space three modules high,



Three landmark buildings have been preserved within the museum precinct (1), two houses with a gallery wing attached to the second. The site faces an important square which needed to be contained by a street wall (2), in scale with the open space, important vistas and the heights of neighboring buildings. The organizing discipline of the gallery (3) consists of a three-dimensional double grid defining

well-proportioned spaces of appropriate scale. In contrast to its strong unified facade, the building form itself had to be accommodating, fragmented and small scale in deference to the landmark structures. The module, therefore, steps down and back in the direction of the existing galleries (4). A connective structure (5) is shaped to define two outdoor garden spaces.





The facade of the building was designed to be read in two ways: as the enclosure of a public square and as the principal entry to a public museum. As architect Cobb explains it: "The scale and character of the elements composing the facade are graded in ascending order from ground to roof. The street-level arcade is intimate and repetitive, with a single exception made for the entry arch, which penetrates to

the second floor as one of a series of large semicircular incisions. These in turn announce the major theme which is then fully developed at the top of the wall, where alternating circles and squares refer to the double grid which orders the interior space of the building. The projection of this wall above the roof allows it to engage the sky and assert its special role in defining and ornamenting the square." The

122-foot-wide and 67-foot-high facade has been beautifully built with handmade water-struck brick from Maine laid in American bond with headers every sixth course and queen closers at each corner. Both the geology of the region and Portland's vernacular architecture are acknowledged by the choice of a local granite (from nearby Canada) for string courses, lintels, trim and arcade paving. Cobb's team worked

on the facade off and on for a period of nine months. An earlier study (bottom left) was one of dozens abandoned as unsuccessful attempts to integrate arcade, entrance and cornice. The structure of the building is concrete frame with concrete block infill. Between the brick surfaces and the cement block is air space with vapor barrier insulation. The brick facade is essentially a curtain wall.



...the two surfaces of the cascade downward washed by daylight from each dome (page 119). Said Cobb: "I was particularly excited to discover in a scale model how the several planes making up the surface of the dome are given definition by light falling on them through the diagonal opening. I wish I could claim this method of daylighting as entirely my own invention, but in fact I cribbed it

stainless steel. The natural light is supplemented by incandescent track lighting.

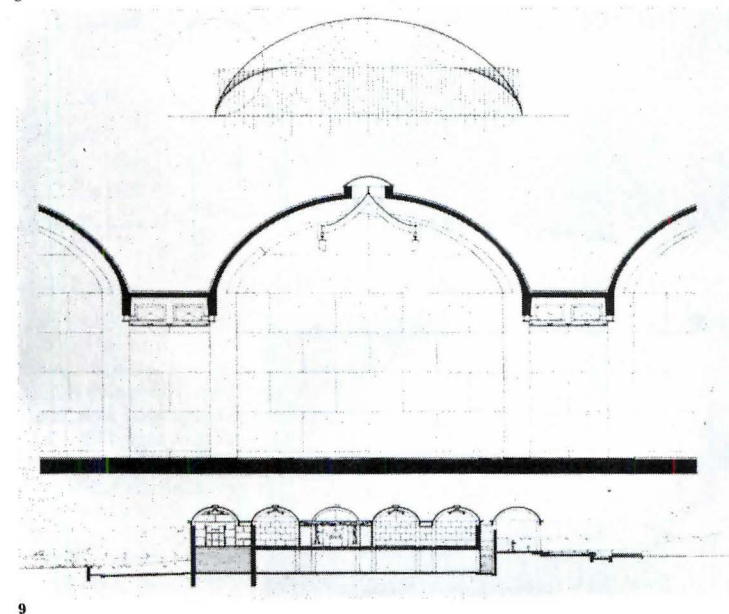
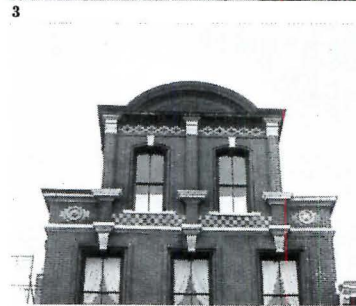
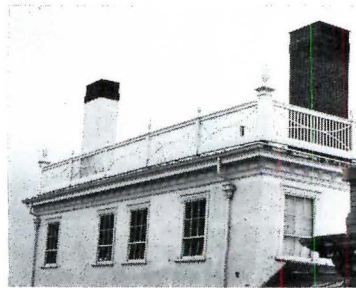
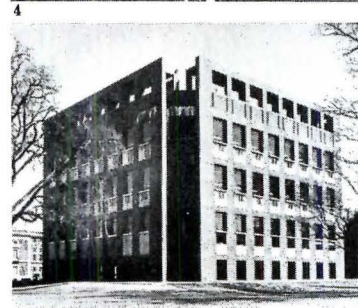
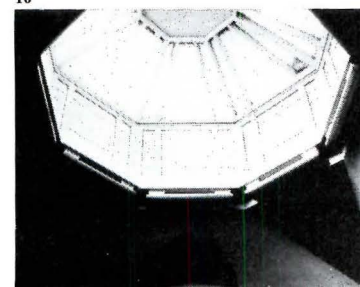
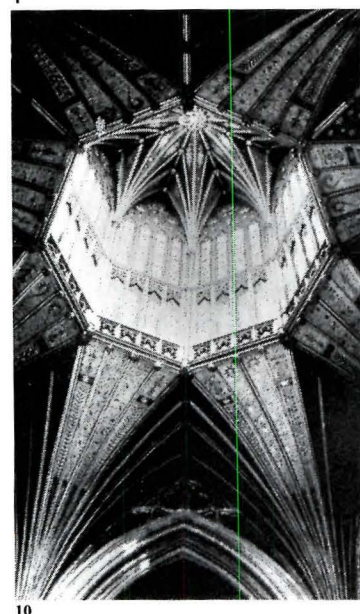
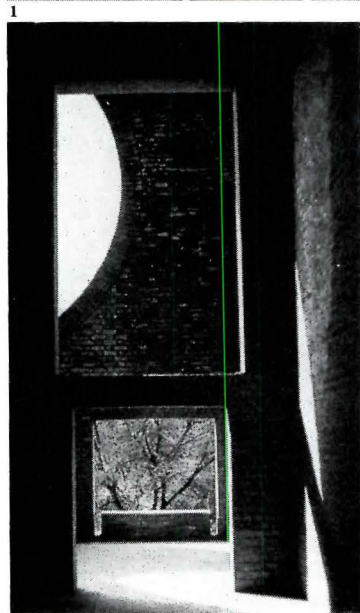
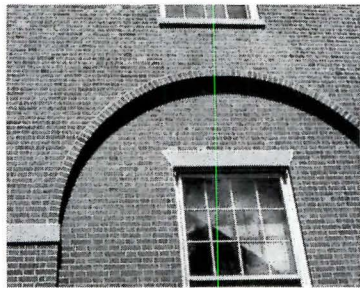


or two or one, and as he passes through low ceiling spaces with artificially controlled light he moves toward pools of daylit space beyond. At each floor level, openings in the circulation modules provide views in a number of directions, and rooms seem intimate, grand or somewhere in between depending on their height and light source.

Cobb's plan has been criticized because it lacks an obvious circulation pattern. Without a grand staircase or corridors as such, the visitor wanders toward the unaccented stairs and finds them almost accidentally, instead of heading for them purposefully because he knows where they ought to be. There is something to be said, however, for the pleasure of meandering uncertainly around the inside of a museum. It can be much like poking through an old quarter of a city, getting lost and finding the way again while discovering surprising and lovely things as one goes. Strollers eventually get oriented in a labyrinthine neighborhood by spotting landmarks, and this is what one does in Cobb's museum. Because the visitor receives few signals as to where he is directly from the museum's infrastructure, he must look elsewhere for clues. Cobb provides several.

The stairways follow the contours of the back of the building, which faces the garden and the rear of one of the landmark structures. At every landing, corner windows overlook this garden and a major street. The arched windows on the principal facade provide generous views of Congress Square, and on a higher floor, small rectangular openings offer at least a peek in the same direction. Finally, an octagonal conservatory at the main level (the pivot or knuckle which reconciles the separate axes of the landmark building and its new addition) offers orientating views in five directions. Thus the Portland Museum of Art, filled with paintings of New England scenes, makes a connection between what is hung on the walls and what is outside, using the surrounding city as a guide to the circulation within.

Cobb's success in relating the interior, the facade, the back of the building and its gardens to the city contributes to the fulfillment of a larger ambition: finding the most appropriate way a particular institution can present itself through architecture. Said Cobb: "This theme has been more important to me than any other and I've kept working on it, first in



Cobb notes: "The Portland Museum of Art is a regional museum in a region that is in itself a museum, in a city that is also a museum; so I believe I had an obligation to connect the new building to the city and the region." To this end he borrowed freely from regional and local sources (1,2,3,4,5,6), transforming their shapes, material and craft in a way that invites New

Englanders to share his delight in their culture. Other sources include Louis Kahn's Indian Institute of Management in Ahmedabad, India (7), the Phillips Exeter Library, New Hampshire (8), the Kimball Art Museum, Fort Worth (9), the lanterns of Ely Cathedral (10) and of Dulwich Picture Gallery (11), a portico by Ledoux (13) the Doge's Palace in Venice (14) and other precedents (12, 15).



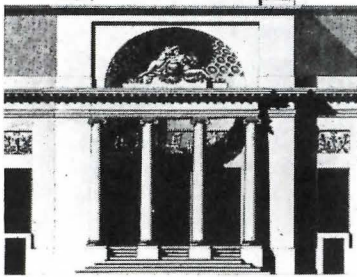
The arcade extending across the entire facade completes itself at the two-story entrance arch. The brick surface of the inner arcade wall transforms without interruption into a vault which rests upon the brick columns and granite lintels. The half dome at the entrance is also continuous with its portion of the arcade wall. By keeping the surfaces of the arcade and entrance as uninterrupted brick skins, Cobb

has joined them visually to his brick facade, thereby binding the building proper to its front. Referring to the arcade and entrance as "the street order," Cobb points out that it consists of paired large openings alternating with single smaller openings. "If the openings had been as wide as the arches," he points out, "it wouldn't have been an intimate arcade. So I put a column in the middle of each

large opening and, to make the difference clear, put benches in each of the smaller ones. The half dome seemed dumpy before we thought of the wood portico or gate, an idea I may have gotten from the Hotel Guimard by Ledoux (13). The rectangular plane of the gate makes the half dome seem rounder. We made the frame as high as possible, pushing it upward until it became a perfect square."



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13



14



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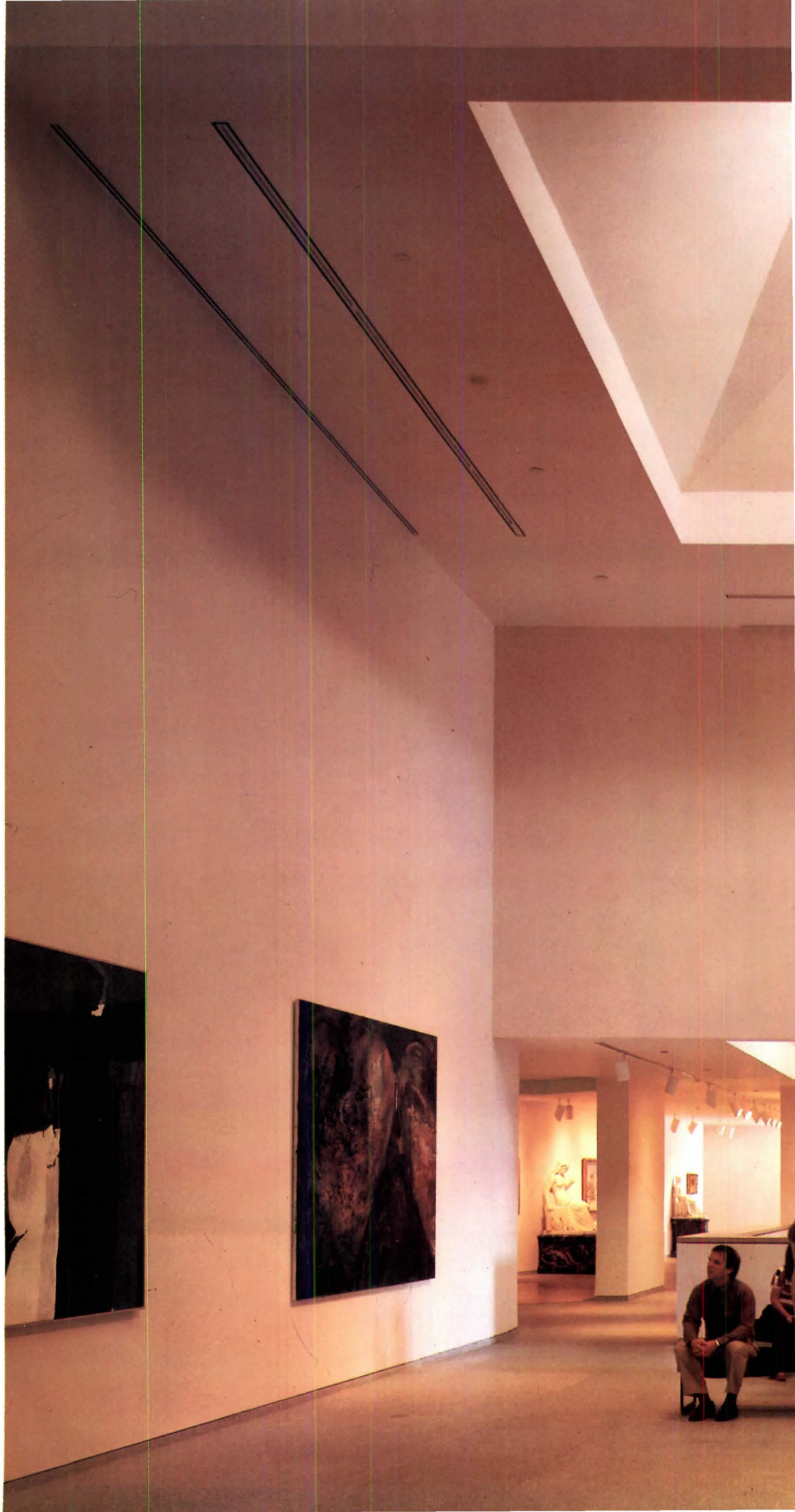




Fredonia [the campus of the State University College at Fredonia (RECORD, January 1971, pages 112-115)], then in the Hancock [the John Hancock Tower in Boston (RECORD, June 1977, pages 117-126)] and now in Portland. In Fredonia, the problem was how to handle a massive expansion of a university system at what had been a very small and obscure college. Hancock is a huge institution that decided to expand into the center of an historic city in a special and precious district. Portland presented the problem in a different way. Unlike Fredonia and Hancock it is an institution open to the public.”

Cobb's solution to all three problems was to impose a strong and simple geometric order. At Fredonia he used a double strategy: his first ordering device was to pull together the existing small and random campus buildings by enscribing them within a circular road 2,200 feet in diameter, bringing them into a new scale commensurate with the size of the structures to come. His second device was a diagonally articulated spine defining the main path of pedestrian movement into and through the academic center of the college and along which, at landscaped intervals, the new and larger buildings were placed.

Cobb's strategy for the Hancock was to try to ameliorate its alienating presence, particularly in relation to Trinity Church and to Copley Square. The building is angled in such a way that it creates a triangular plaza between the church and the tower, focusing attention on the apse. Thus pulled back, the tower offers a slender edge to the square. The surface, kept plain and reflective in contrast to Richardson's splendid sculptured surfaces, also helps the building recede. Only from less important vantage points does its immense bulk impose. According to Cobb: "The Hancock deepens one's perception of the problems of institutions in society because it is so clear, so minimal in a sense, so single-minded in its pursuit of the impossible goal of reconciling its presence in Copley Square. Architecture at the very least can illustrate, it can be used to make people aware of the issues in society, even though it can't solve the issues. But in spite of the issues it raises, and however beautiful it may be, the Hancock is self-limiting as a work of architecture because it cannot transcend its private, corporate program. The Portland Museum, however, has everything the









Hancock lacks. It invites participation by a public concerned with culture, not commerce, and as such it has great richness. Because it is a museum, it has the extraordinary attribute of being available and accessible to all, and the totality of its interior as seen on the outside can be experienced on the inside. Institutional buildings rarely have this quality.

"My strategy for Portland was to address two different urban scales and personalities," Cobb explains. "The facade is space primary, the rear is garden primary. For the facade an *architecture parlante* was called for. I wanted the building to externalize its presence, not hide itself, but speak. I am accustomed to designing buildings like Hancock that speak in their volumetric presence, but the Portland facade was a new problem. I wanted it to enclose the square in a way that speaks to the square. It is principally the enclosure of the square and only secondarily the enclosure of the building.

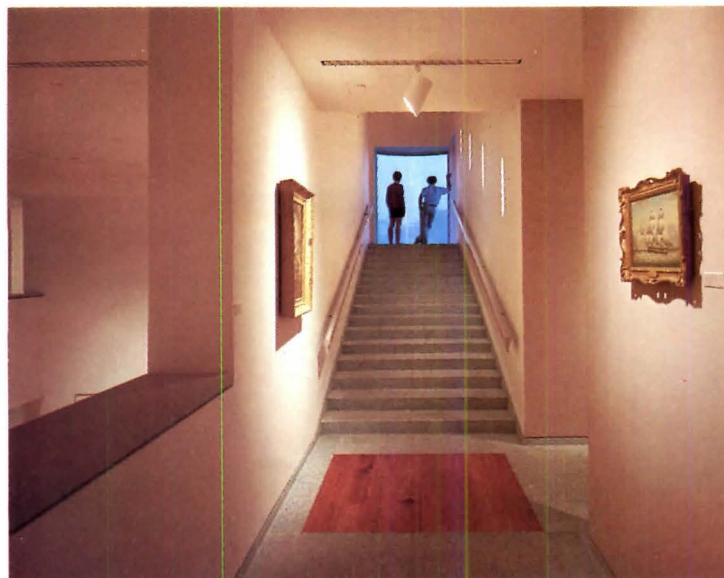
"*Architecture parlante* has to do with the figurative elements that make a statement. This is the first building in which I have been significantly concerned with the recovery of figure in architecture. I have always been interested in form."

For the Portland facade, Cobb has adapted and transformed figural motifs from the recent past (Louis Kahn), the 18th century (Ledoux) and others. The back of Cobb's building, inside and out, is pure form, the front is figure, but the principal figure—the big circle and its accompanying small square—refers to the form of the interior and of course to its function.

The relations of figure and form to meaning are essentially contradictory, as the conflict between the back and front of Cobb's building confirms. Thus Portland, like the Hancock, dramatizes issues it doesn't solve, and this should be all right with Cobb.

But did he achieve his principal goal, an *architecture parlante*? I think he has. In his first lecture as newly appointed chairman of the Department of Architecture, Harvard University Graduate School of Design, Cobb asked to see embodied in the architectural program four qualities that he deems essential for the fulfillment of his educational mission: coherence, rigor, openness and audacity. And it is of these qualities that his building speaks.

Mildred F. Schmertz



Portland Museum of Art  
Charles Shipman Payson Building  
Portland, Maine

**Architects:**

I.M. Pei & Partners—H.N. Cobb, design partner; L. Jacobson, managing partner; A.P. Moore, associate partner/construction administrator; D. Gardner, associate/project architect

**Consulting architects:**

Terrien Architects

**Engineers:**

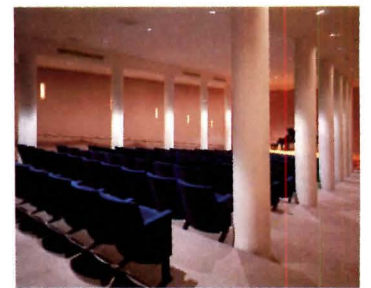
Skilling, Helle, Christiansen, Robertson (structural); Kunststadt Associates (mechanical)

**Consultants:**

Hanna/Olin Environmental Design & Planning (landscape); Rolf Jensen & Associates, Inc. (life safety); Joseph M. Chapman, Inc. (security); J. Meadows & Associates, Inc. (estimating); Cerami & Associates, Inc. (acoustics); Will Szabo Associates, Ltd. (audio-visual); Travers Associates (traffic); Jules Fisher & Paul Marantz, Inc. (lighting)

**General contractor:**

Pizzagalli Construction Company



Windows in the main facade (top), the conservatory (middle) and on staircase landings, (bottom) overlook the city and just as importantly reveal the life of the museum to the city. The museum includes a small auditorium with 187 seats. The photo opposite is of the grand hall from the mezzanine, a magnificent space shaped and lit by a cascade of clerestory lanterns.







# An urban surprise

Meola Studio and Apartment  
New York City  
Gillis Associates, Architects

Artists customarily look for large spaces at reasonable cost in which to practice their art. If they want to be in town where the action is, as a busy commercial photographer must be, the problem of both space and cost increase. And if town happens to be Manhattan, an extremely tight market aggravates the case.

Photographer Eric Meola and his architect, Ralph Gillis, seeking a building to house both studio and apartment, found a truck-storage garage south of Greenwich Village. The light gray brick facade of the old building, though cleaned, repaired and newly fenestrated, remained essentially as was in the semi-industrial neighborhood. A new recessed facade at street level declares the building's dual purpose with different materials and different lighting on a three-part composition. While the residential entrance at the center (opposite) glows warmly with a red door and light diffused through glass blocks, the studio entries—garage to the left and general reception to the right—are clad in businesslike aluminum panels. At the end of the day, the studio facades produce their own warm glow as the west-facing matte-finish panels pick up and reflect the colors of the setting sun.

The commanding functional requirement was for large, high space to accommodate both elaborate equipment, which includes tall light stands, and a variety of photographic subjects, which may be as small as a diamond ring and as large as an automobile or two. Studio A, the larger of the two adjacent studios, needed a minimum height of 20 feet and a minimum width of 20 feet for cycloramas. Studio B provides for kitchen and table-top setups. The rear wall of the garage folds so that automobiles can drive directly from the street into the studio (see plans on next page). At the same time, a more conventional business entrance receives customers, models and messengers.

At the top of the building, separated from the studio floors by a new mezzanine, the Meolas' apartment takes the character of a town house, quiet and rather isolated from the hurly-burly of the city. An angular glass-block box juts out at street level. The red door, red steel pipe columns supporting the translucent masonry, and precisely tooled red grout clearly distinguish a private residential entrance.

The mezzanine serves both the studio and the apartment, thus merging the two halves of the building. More important, this mid-level floor resolves the complexities of the necessary double circulation. At the front of the building, the main staircase connects a vestibule (bottom right) with such ancillary residential spaces as guest room and laundry, as well as with the apartment at the top. At the back, a circular staircase, jacketed in a glass-block cylinder, connects studio and offices; the larger of the offices, which overlooks the studio, serves in addition as Mr. Meola's presentation area, while the smaller provides workspace for Mrs. Meola's modeling agency. Though only the owners have access to both areas, the stairways and balconies have been color-keyed for psychological differentiation—blue for business, red for residential. G.A.



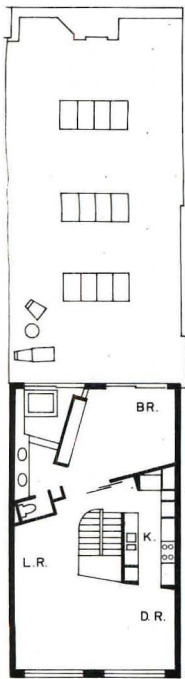
Eric Meola photos



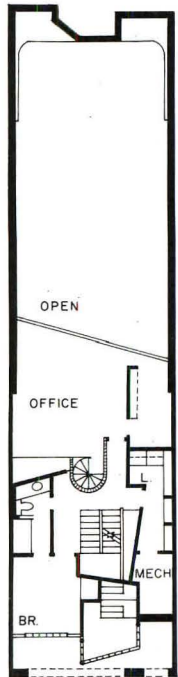


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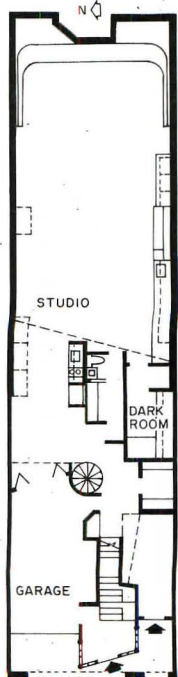




SECOND FLOOR



MEZZANINE



FIRST FLOOR





At the top of the old garage, the Meolas' apartment spreads out in a quiet isolation rather luxurious in crowded Manhattan. The angular wall that leads from living room to bedroom conceals stereo equipment and closets (both photos at top), while the kitchen gains apparent volume from an aperture above the stairway. A terrace outside the bedroom shares the rooftop with skylights above the studio. A glass-block cylinder around a circular stair can be seen from the inside in Meola's office and from the outside in the apartment's lower hallway (directly below). Custom-organized cabinetwork and wall hooks foster the tidiness essential to a busy photography studio (bottom left) where equipment includes ceiling-mounted lights that tilt, lower and move about on tracks. The rear wall is cornerless—that is, all angular corners have been curved to eliminate shadows.



*Meola Studio and Apartment  
New York City*  
**Owner:**  
Eric Meola  
**Architects:**  
Gillis Associates—Ralph Gillis,  
Marcia Seitz-Previti, Robert Perry,  
William Bott  
**Engineers:**  
Severud, Perrone, Szegezdy &  
Sturm—Edward Messina  
(structural); Ray Prego  
(mechanical)  
**General contractor:**  
L. F. Davis



# Purpose and place

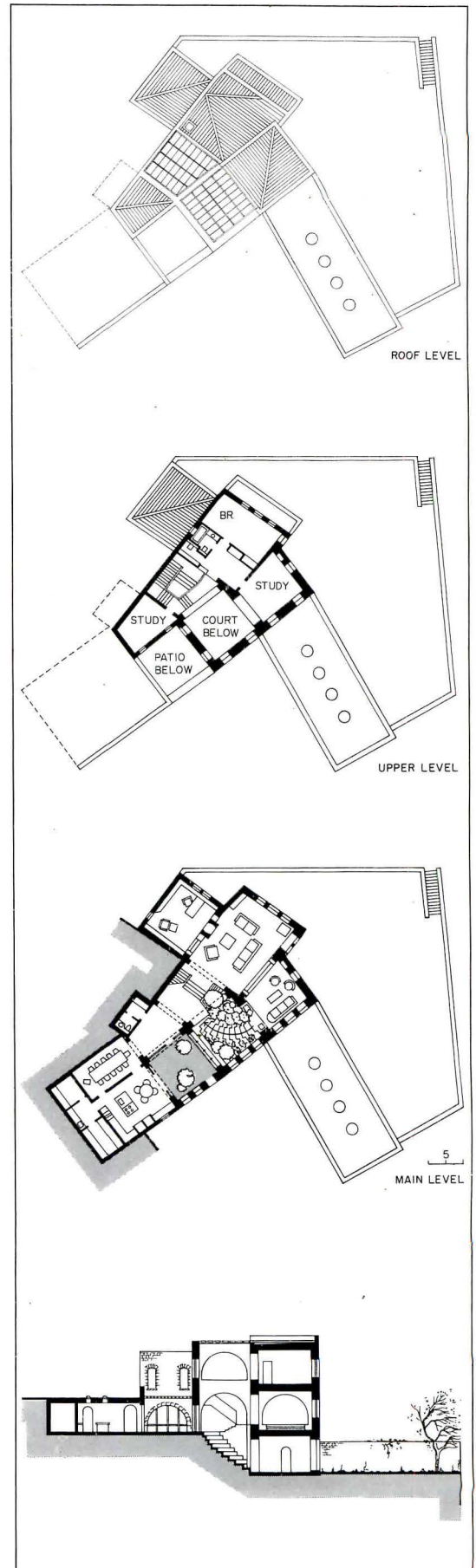
Van Leer Residence  
Jerusalem, Israel  
Moshe Safdie and Associates Inc., Architects

These two houses—one in Jerusalem, the other in Alabama; the first in an important historic district located just outside the Jaffa Gate, the second in an elegant suburb; one a restoration conforming to strict preservation codes, the other a free expression of its owners' fantasies—are, as one would expect, quite different in form. According to their architect, Moshe Safdie: "Everything is different—the context, the materials, the construction, the cultural milieu, the lifestyle of the two couples, the formal expression of the construction of each house. I exaggerated the masonry quality of the stone bearing walls in the Jerusalem house and in some ways I forced and exaggerated the possibilities of the timber frame in the Alabama house. The suburban house, generated by geometry and an unusual relationship to its site, seems to float as it grows out of the arrangement of its volumes. In both houses I endeavored to bring large quantities of daylight deep inside. The Jerusalem house is connected spatially by a large courtyard with a glass roof and a spiral stone stair. The stairway and halls of the Alabama house interconnect three levels and these are awash with light from a skylight that is built into the roof facing south. The Alabama house is dynamic, however, while the Jerusalem house is calm.

"My Alabama client told me that his fantasy was to live in the control tower of the Dulles Airport. I tried to see beyond the literal statement. He wanted something that was very transparent, extrovert, with a sense of command over the surroundings. I found these to be exciting connections and began working with them. Many of our decisions came out of these conversations. For an example it was an unconventional thing on a site of this kind for me to have put the bedrooms on the ground floor, the kitchen, dining and study at the entrance level and the living room on top. The living room is like a tree house—one feels suspended in the woods. Of course there are other living spaces throughout the house—zones, territories for each member of the family. The Jerusalem house also has more than one living space.

"Rebuilding the Jerusalem house was a very different experience because what we started with was not an owner's fantasy, but a ruin. Many think that when you begin with a ruin it predetermines the results. Not so. I added 50 per cent to the volume of the house. There was nothing there but a few stone walls. We brought in stone that matched and kept the rhythm of small vertical windows, which are a part of the vernacular tradition of the Jewish and Arab houses in the region. From the outside it looks like a modest late-19th-century house, resembling all the others in the neighborhood. But inside there are large arched openings connecting the spaces and distributing light from the skylit atrium.

"The Jerusalem house was built with a high level of community responsibility—it is urban, it is a collective domain. The Alabama house was built as a man's private world. Looking back on these two houses I am reminded of the enormous effects that a conception of 'place' brought to each design. It is important to remain attentive to what is special about a place." *M.F.S.*















*Van Leer House*  
 Jerusalem, Israel  
**Owners:**  
 William and Lea Van Leer  
**Architects:**  
 Moshe Safdie and Associates  
**Engineer:**  
 Shaviv Gordon  
**General contractor:**  
 Yoram Moholiver



*The lower and upper parts of the Jerusalem house were totally separated by a rock outcropping. Safdie caused the rock to be carved to create a spiral stone stair (above) connecting the two parts and forming an atrium that integrates all parts of the house. The atrium became a three-story garden with a retractable glass roof (top right). Additional rooms were constructed on the second and third levels, surrounding the atrium. In the course of excavations, two large cisterns were discovered: one at the ground level, the other buried in the hill on the second floor. The lower cistern was lit with small skylights and converted into a swimming*

*pool. The upper cistern was made into the kitchen. The principal living floor, including the main entrance, the kitchen, dining room, living room and library, is on the second or middle floor. The first or ground floor accommodates the master bedroom and swimming pool, both opening into a walled garden. The top floor includes a study and two additional bedrooms. The interior finish is white plaster with white limestone floors. The exterior walls, both restored and new, are made of traditional golden-color Jerusalem limestone and have small windows. These details are characteristic of the Jerusalem vernacular.*





The owner of the Alabama house, an ophthalmologist with a taste for Op Art, wanted his house to overlook and command the city below. The completed wood-frame house consists of three principal levels. The central staircase leads down to a fully glazed garden room that faces north to the city. This lowest level, which is dug into the hill, also contains the bedrooms. The house is entered at the second

level, which also accommodates the kitchen, dining room and library. The upper level, consisting entirely of a huge living room, opens up to and is cantilevered toward the city. The continuous, inclined, south-facing roof contains large skylights, which capture the sun in winter, penetrating into all levels of the house. During the summer, the skylights are shielded by a rolling, white canvas screen.

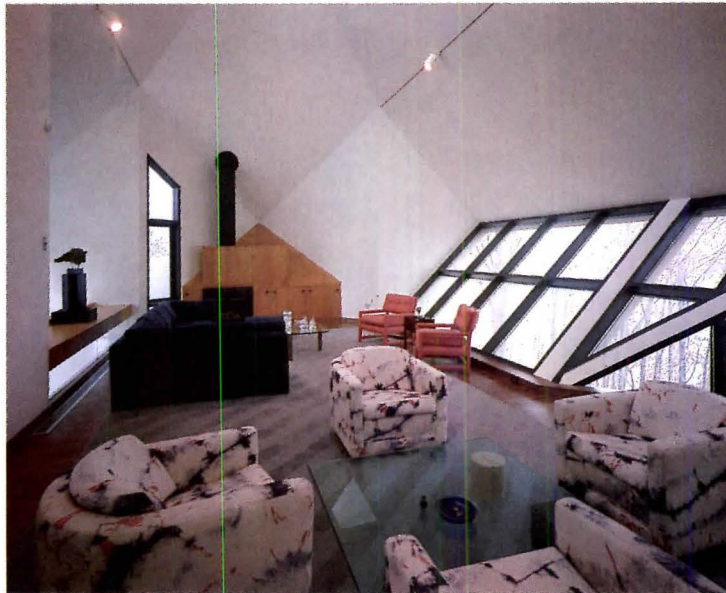
Timothy Harsley photos







Although carpenter-built on the site in wood and surfaced with synthetic stucco, this house, finished in 1981, has a geometry derived from Safdie's earliest experiments with modular component systems designed for industrial manufacture. It can be read as a segment of one of Safdie's huge unbuilt housing schemes of the 1960s, resembling closely the configurations of Habitat Puerto Rico and its variants. While it recalls Safdie's continuing interest in what he has called "additive architecture," the house, paradoxically, also appears complete and contained. Safdie's geometry is most apparent in the living room (photos right). The skylight (opposite) faces south, bringing sunlight to all three floors.



*A private house*

**Architects:**

*Moshe Safdie and Associates, Inc. — Moshe Safdie, principal-in-charge; William Gillitt, associate-in-charge; Hugh John Sullivan, project architect*

**Associate architect:**

*John M. Fuller (supervision only)*

**Engineers:**

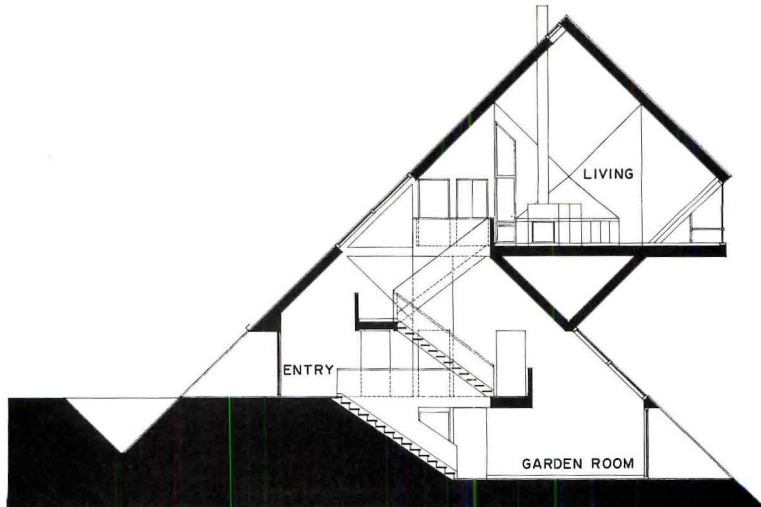
*Zaldastani Associates (structural); Cone, Hazzard and Nall (mechanical)*

**Consultants:**

*Charles H. Stretton, Inc. (construction specifications); Rosemary Rodgers (interiors)*

**General contractor:**

*The Brice Building Company*









# A maker of office furniture develops lighting and acoustics for its own offices

When Steelcase, the manufacturer of office furniture, built a new headquarters building for itself in Grand Rapids, Michigan, it resolved that its own employees should not be treated like the shoemaker's children. To that end, the company called on its staff of space planners and its research and development staff to assist architects WBDC, Inc., also of Grand Rapids, in the design of space that would make office workers comfortable while using Steelcase products and displaying them to advantage. Additionally, and importantly, the occasion offered a chance to push the technical understanding and development of open office systems for possible application to commercial products. Special consideration was given to two areas of design that gained importance as open offices proliferated: lighting and acoustics.

## **Lighting: for visual impression and for use**

With its lighting, using a combination of task and ambient light, the company aimed for a general visual impression and for specific workstation effectiveness. The designers' first goal was brightness, both because of its association in most people's minds with cleanliness and because the offices double as a showcase for the company's product. An additional goal was a sense of spaciousness, for its own attractiveness as well as for the occupants' comfort. Michael Webster, Steelcase's manager of product research, and Gary Steffy, an independent lighting consultant, remembered lessons learned at Pennsylvania State University about the importance of brightness in this respect: well-lit surfaces, both overhead and at the sides, visually enlarge volume, thus raising both spirits and the level of activity.

At the same time, however, the designers did *not* want complete uniformity of brightness, only a fair balance of brightness for ceiling, walls and windows. "Many people feel you have to have uniformity," Webster observes. "Baloney! You don't have it at home or in a restaurant. And it becomes sterile. Nonuniform lighting creates a more interesting and relaxed environment." The designers did want a more or less uniform brightness on the furniture's vertical surfaces, on the other hand, without uncomfortable visual contrast or disfiguring shadows and hot spots.

Beyond the broad requirements for the macroenvironment, the company's management also drew a list of three priorities for the working environment. First in order was to design for the most effective task performance, and second, inextricably related to the first, was to design for visual comfort. Only third does the list mention energy efficiency: if 90 per cent of an employer's operating costs goes to payroll and other people-related expenses, the company figured, savings in the 0.6 per cent that goes to lighting are insignificant. (Even so, the designers, allowed 2.5W/sq ft, achieved a connected load of 1.9W/sq ft, including task and ambient fixtures plus incandescent lights for art. The level is even less, of course, at night or when any worker is away from his desk during the day.)

The ambient lighting system makes use of two fixtures, both giving indirect illumination reflected from the ceiling and vertical surfaces, and designed to maintain an over-all level of 30 fc in work areas, 20 fc for circulation. A freestanding HID unit, supported by four corner poles, supplies some ambient light as well as station identification; the units are automatically switched, though each has a manual override. The second device calls for three fluorescent lamps recessed behind prismatic lenses at the top of overhead storage units; switching for either two or three of the lamps is controlled by the workstation's user.

To supply up to 90 fc of incident light on work surfaces, the task lighting system also uses two fixtures. The major duty of light for desktops is accomplished with the company's Eclipse

light, a fluorescent lamp wrapped with a revolving plastic mask that allows the user to increase or reduce brightness. This unit, switched by the user, is mounted below overhead storage. The second task lighting unit, manufactured not by Steelcase but by the Koch & Lowy company, is a small movable fluorescent lamp on open counters.

Though only some workstations now have CRTs for computers or word processors, the design assumes that eventually nearly all workers and supervisors will have them. Tinted windows as well as low-level ambient light were used to prevent glare on CRT screens. For the same reason, only emergency lights are mounted at the ceiling. The main computer room, where the placement of stations requires only limited flexibility, does have general overhead lighting.

## **Acoustics: shaping the sound to the purpose**

In defining standards for acoustic performance in its open-plan offices, Steelcase R&D relied on some subjective, albeit rigorous, laboratory testing. The company could certainly ascribe numbers for such technical values as NRC and STC ratings, and R&D had worked out a series of tables that allows designers to balance trade-offs among panel types and heights and sentence intelligibility relative to a listener's placement. Nonetheless, the selection of furniture for various job categories required more than abstract assignment according to numbers. Executives, using their ears, took their places in lab set-ups to determine whether a given sound level was appropriate for managers, for technical or financial personnel, for secretaries, for any number of tasks.

As a result, the designers described four levels of desired acoustic performance. For managerial activities that require thorough confidentiality—that is, 0 per cent sentence intelligibility (SI) for conversation outside the work area—the plan provides private offices with full-height partitions. Supervisory workstations within the open plan requiring 0 to 5 per cent SI got 75-in.-tall panels rated at NRC .80 and STC 26. Professional and technical personnel, who also need visual privacy but an SI of only 5 to 30 per cent, got 65-in. panels rated NRC .60 and STC 20. Finally, clerical and other workers who need ease of communication for common tasks were given auditory environments of 90 to 100 SI with either 53-in. panels for visual privacy or with no panels. To reduce noise reflection overhead, acoustic ceilings, rated NRC .95, have almost no hard-surfaced lighting fixtures.

In addition, all work areas except private offices are provided with an exceptionally sophisticated mixture of masking sound and Muzak. It should be made clear at once that the Muzak component does not produce hummable tunes. Indeed, the music is all but inaudible, its purpose simply to enliven the otherwise bland masking sound. Rather the sound system was designed to increase comfort and speech privacy in work space to the sought-after levels. The frequency patterns of both masking sound and Muzak were reshaped electronically to the curve taken by the human voice as attenuated by acoustic office furniture (see graph on page 135) and are reproduced through concealed ceiling speakers only at sufficient volume to achieve the specified levels.

Apart from three zones in the office space, the designers identified three other acoustic zones. Transition zones chiefly comprise corridors, where Muzak gets a little louder (though still not hummable) for a brisker over-all sound. And two zones have different sound systems entirely: the public zones, such as reception and elevators, and the three showrooms around the central atrium receive ordinary taped music, which may be selected to suit special occasions. *G.A.*



In the new headquarters for Steelcase, all office lighting, both ambient and task, is moved as furniture is rearranged; the only ceiling-mounted fixtures are occasional emergency lights. Lights for general illumination include tall square HID standards and fluorescent lamps mounted on top of storage units. Though these fixtures are automatically turned on by the building's maintenance

computer, individual switching allows manual override. The light pattern on the ceiling will obviously change as furniture is moved, but it can be, and was, predicted by computer model. To balance the different colors of HID and fluorescence, the designers specified different lamps—3000K for HID, 3200K for fluorescent.



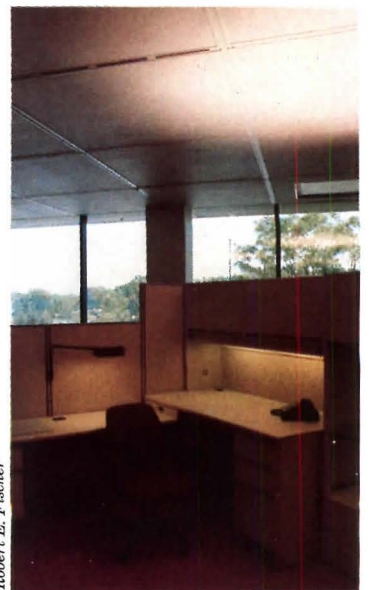
Timothy Hursley photos except as noted





Managerial offices that require confidentiality of speech are separated from general office space by full partitions, either glass (as directly below) or opaque. Private office lighting necessarily differs from that at workstations and may include ceiling fixtures. A typical workstation for professional and technical personnel faces a 65-in. panel that affords "normal" speech privacy (at bottom). The ceiling

reflects ambient light from fluorescent lamps mounted at the top of the panel, while the desktop gets task light from a fluorescent lamp mounted below a storage unit. A small movable countertop lamp provides further task light. Managerial offices occupy inner walls around the core, while workstations get the benefit of daylight and views.

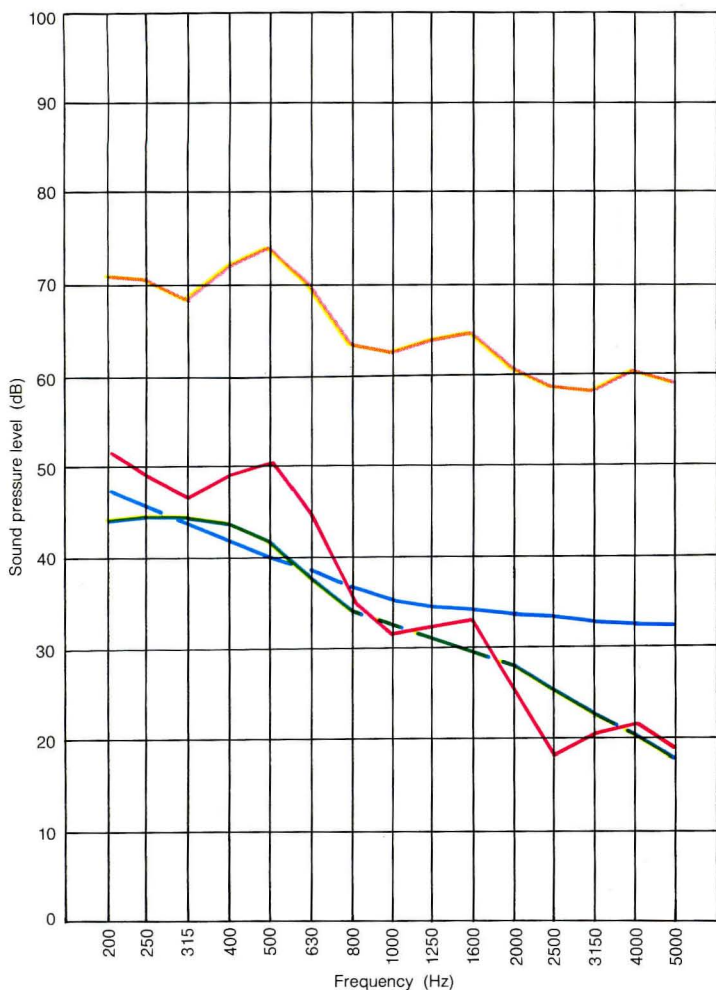


Robert E. Fischer

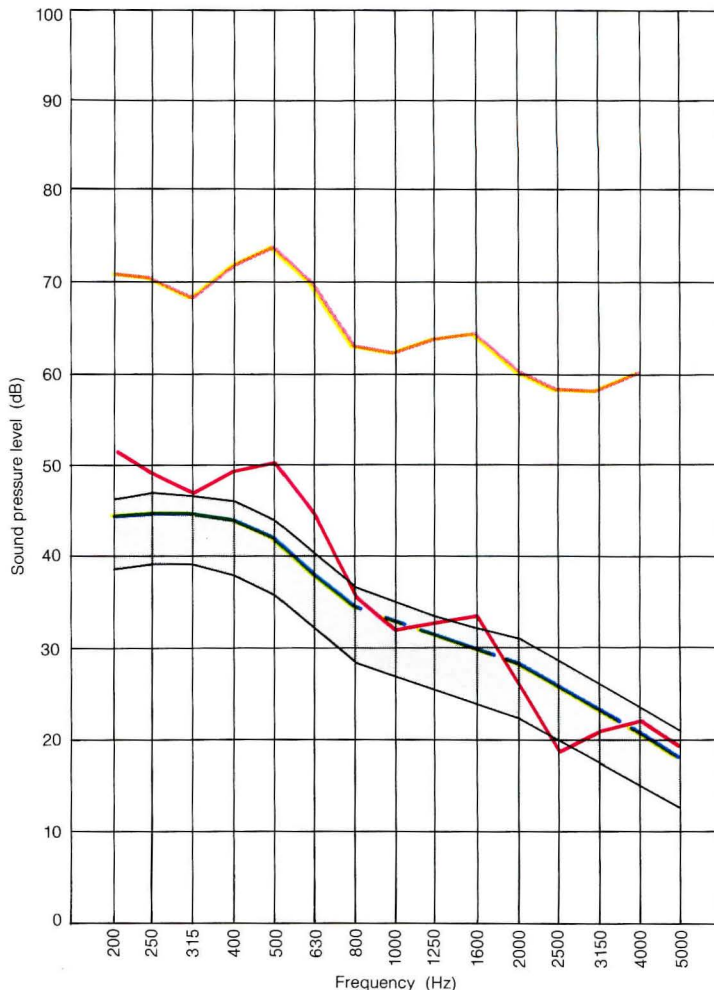


To increase auditory comfort in office spaces, the Steelcase acoustics staff altered the "shape" of both generated masking sound and of Muzak. The Modified Preferred Noise Criterion system alters standard masking sound particularly in the high frequency range to resemble more closely the curve taken by the human voice; the new sound thus efficiently does no more than need be done, at the

same time eliminating sometimes irritating high sounds. The Muzak dynamics were similarly altered and then mixed with masking sound. The resulting over-all sound is scarcely noticeable, not vulgarly tuneful but subtly buoyant.



Speech level at listener's ear at adjacent desk for 65 in. panel  
 MPNC 38 masking sound  
 NC 40 masking sound  
 Male casual voice



Speech level at listener's ear at adjacent desk for 65 in. panel  
 MPNC 38 masking sound  
 Muzak dynamic range  
 Male casual voice

Acoustic zones	Masking sound	Masking sound plus Muzak	Foreground music
1. Private offices	PNC 34	none	none
2. Open plan	PNC 37	PNC 38	none
3. Open plan	PNC 37	none	none
4. Transition space	PNC 35	PNC 37	none
5. Public space	none	none	taped
6. Showrooms	PNC 35*	none	taped†

\* On/off switches in each showroom.  
 † Volume manually adjustable in each showroom.

The shaped acoustics of Muzak combine in small increments with masking sound. In open plan offices, for instance, masking sound at PNC 37 was increased only to PNC 38 with added Muzak, leaving music all but inaudible while producing an upbeat over-all sound. In public spaces and showrooms, taped recordings can be played according to taste and occasion.



# Unique cantilevers carry 400,000 sq ft of tower

Four months after architects Fujikawa Johnson and Associates began the design of a twin-tower complex on an 83,000-sq-ft site on Chicago's Wacker Drive, the site's developers, JMB Realty and Metropolitan Structures, issued the architects a major and difficult program change.

To attract as prime tenant the Chicago Mercantile Exchange (and confident the Exchange would attract many other tenants), the developers required that the building be revised to include a 40,000-sq-ft clear-span trading floor and a 30,000-sq-ft expansion trading floor.

The change presented structural engineer Shankar Nair, a principal with Alfred Benesch & Company, with some complicated "givens":

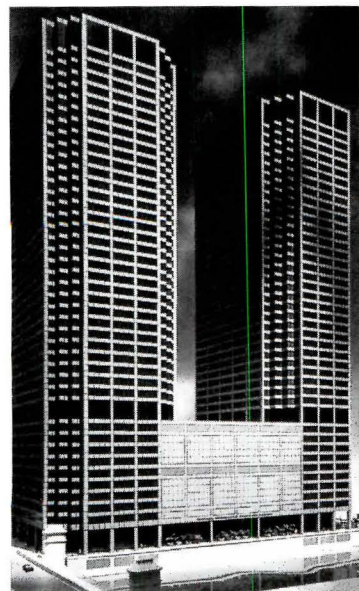
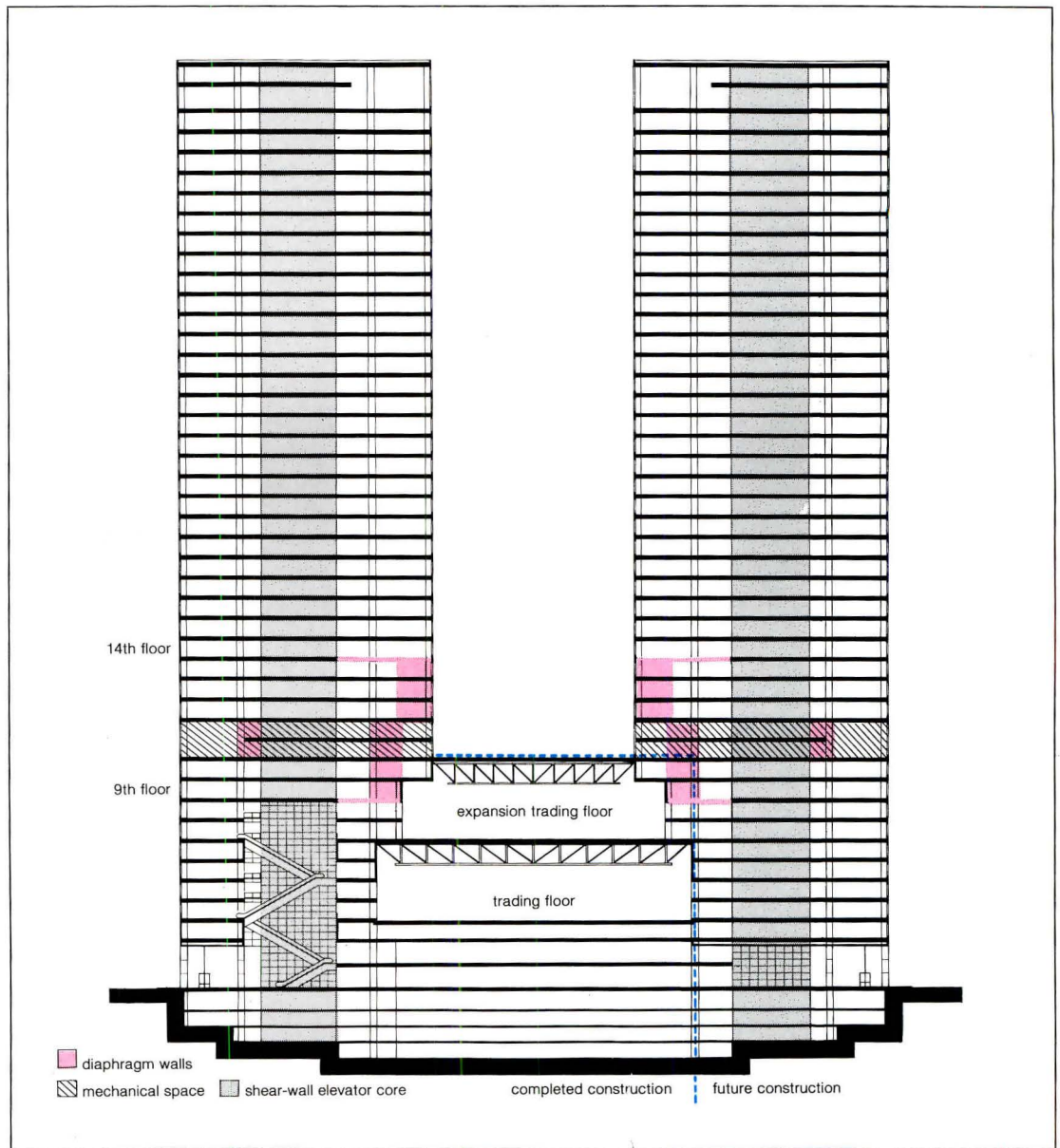
1. The developer did not wish to make the tower floors smaller, since the 30,000-sq-ft towers already in design represented an optimum balance between floor area and building height, providing tenants with efficient, flexible spaces while utilizing elevator-core space to its best advantage.

2. Given the twin 30,000-sq-ft towers and the 83,000-sq-ft site, the requirement for a 40,000-sq-ft trading floor (and the expansion floor with 30,000 sq ft of space) meant that a solution had to be found to carry loads to the ground "around" the trading floors—with no columns penetrating the huge open spaces.

3. A final structural complication was that the developer did not want to build the second tower until space in the first was largely rented.

Engineer Nair's solution (see drawings at right) was to cantilever a substantial area of the tower floors over the trading floors. The first and simplest cantilever solutions the architects studied with the engineers, though structurally successful, seemed to them to impose design constraints—permanent penalties such as inefficient vertical transportation systems, contorted mechanical layouts, and badly compartmentalized office plans. To avoid these common penalties, which would have been caused by long and extra-deep girders necessary to resist bending in conventional cantilever designs, Nair took a different approach.

His design supports the perimeter columns of the tower on a series of vertical concrete diaphragms assembled into brackets seven stories high.

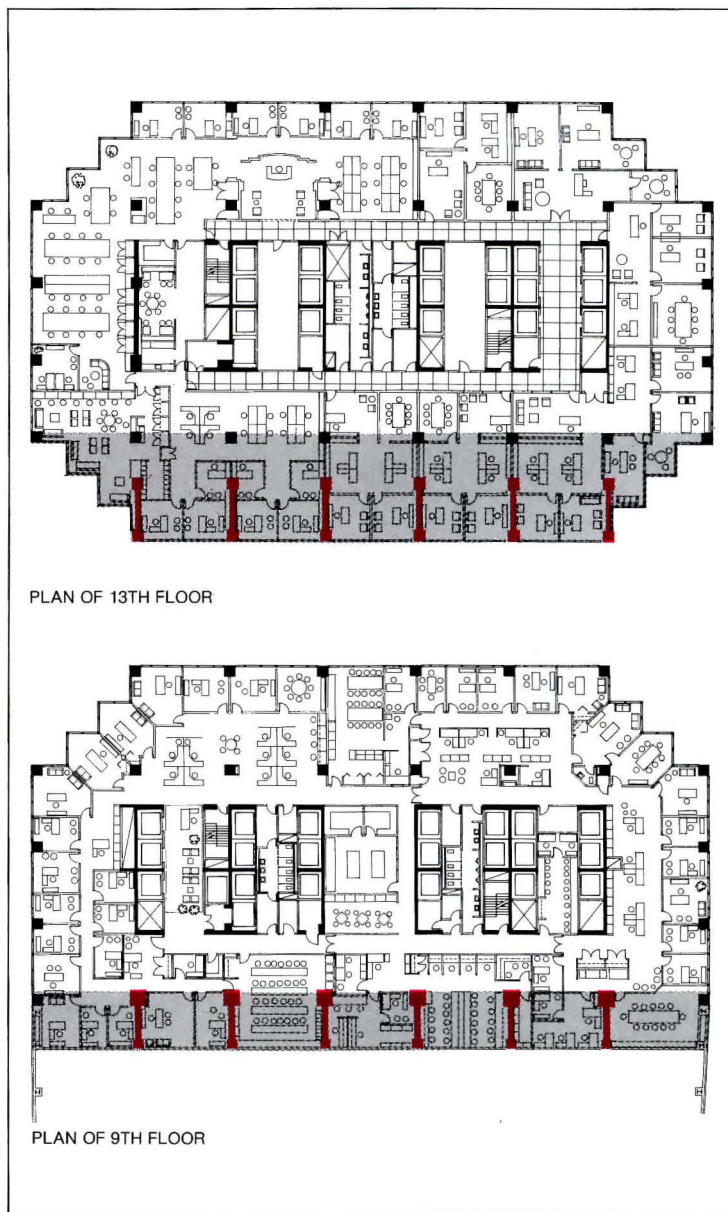
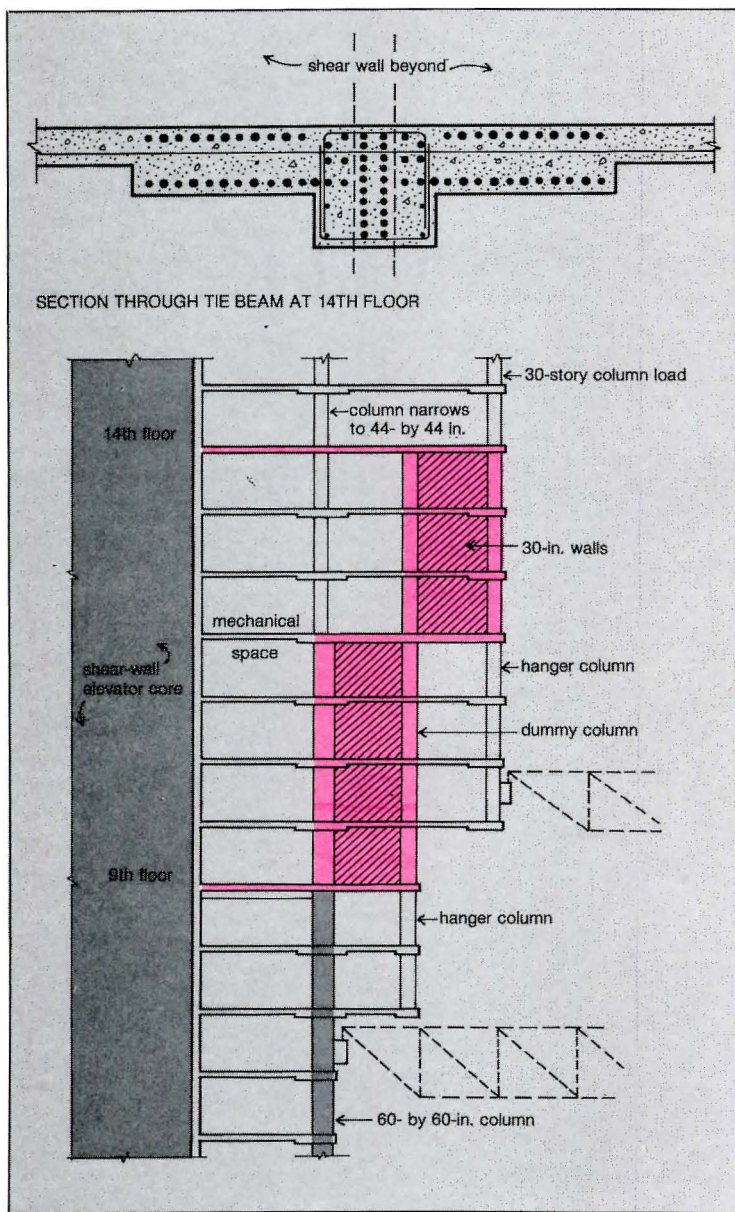


The load transfer mechanism (shown on all drawings in red) cantilevers 32- by 150-ft sections of 30 tower floors—more than 400,000 sq ft of space for both towers—over two trading floors beneath. Its unique design not only permits the trading floors to be column-free, but allowed construction to be phased so the second tower could be built (note dotted lines) after space in the first tower was rented. Whether to

express the massive diaphragm walls was a question that the architects earnestly considered. Because they thought few would understand how the diaphragm walls could support the floors and since the walls were designed to be as unobtrusive on the interior as possible, they were not expressed in the final design (see rendering at left).



The structural elements of the cantilever (shown in red on plans below) make little impact on the project's over-all design. Intelligent space planning further minimized it. The top plan shows typical layouts for the eleventh, twelfth, and thirteenth floors. The bottom plan shows a layout for the ninth floor. Shaded sections of the drawings indicate the cantilevered area of the floors.

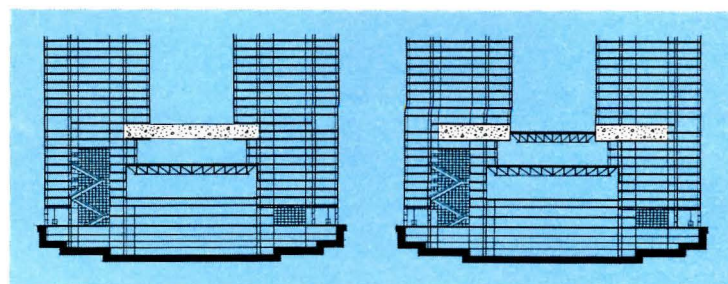


The load-transferring cantilevers consist of 30-in.-thick reinforced concrete diaphragm walls offset to form one rectangle four stories high and a second one of three stories. The two rectangles are joined by a rigid, heavily reinforced dummy column. The resulting brackets rest on 60- by 60-in. columns. Loads from the perimeter columns at the fourteenth floor flow diagonally through the brackets to the ground via these 60- by 60-in. columns. The high moments developed in each bracket from the 30-story column load are resisted by tie beams in the fourteenth-floor slab and compression struts in the ninth-

floor slab that tie into the structure's shear-wall core. The heavily reinforced tension ties (see section at top of page) are concealed in the ceiling plenum of the thirteenth floor. Hanger columns suspended from the cantilever support trusses for the expansion trading floor and frame out additional tenant space.

Before developing the final design for the load transfer mechanism, the engineers considered other approaches. One scheme diverted the loads around the trading floors by resting the two towers' facing perimeter columns on girders spanning the trading floors to interior columns (section at bottom left). This approach would have severely compartmentalized floor plans and mechanical layouts from

the ninth to the fourteenth floors. A second idea was to rest these columns on girders extended from the shear-wall core (section at bottom right). Because of the depth of girders required to withstand the loads, this approach would have increased the space between elevator shafts and resulted in small elevator lobbies and wasted space for the full height of the building.





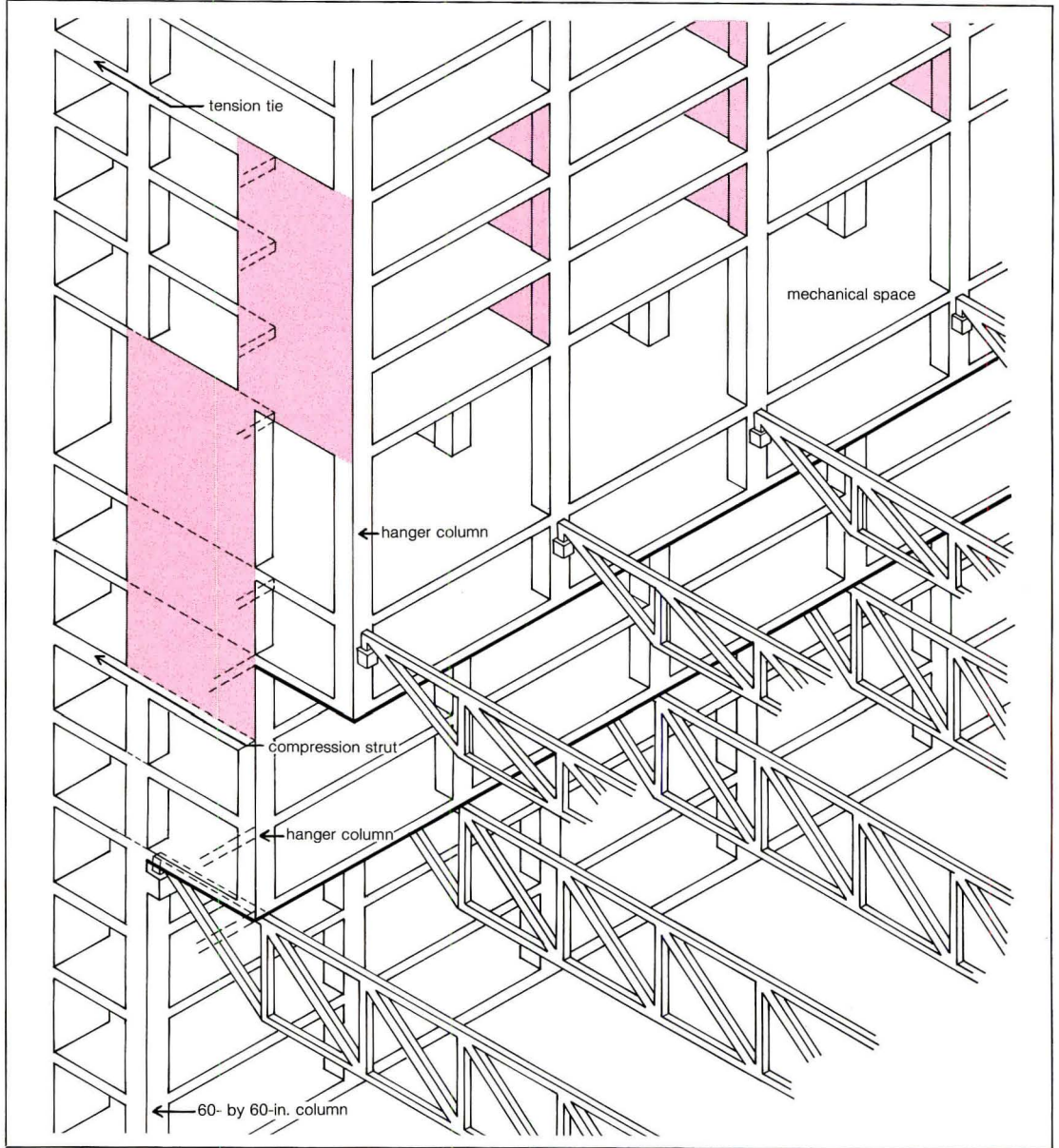
These diaphragm walls are 30 in. thick, and connect to the elevator-core shear walls with heavily reinforced tie beams (in tension) at the fourteenth floor and struts (in compression) at the ninth floor. A "dummy column" makes a rigid connection between the upper and lower diaphragms. This refined cantilever system transfers the loads diagonally from the tower's perimeter columns to a row of six oversized (60- by 60-in.) interior columns (outside the perimeter of the trading floors, of course) that carry the loads of the cantilevered floor sections to the ground.

Because the diaphragm walls occupy only 30-in. by 16-ft areas on the floor plan, they integrate harmoniously with interior plans and the building's service systems. Mechanical systems, for instance, are not blocked out entirely as with other approaches (see sections at bottom of page 137).

Structurally, the diaphragm walls and the dummy column that connects them are in pure shear. Though there is no bending in the diaphragm walls, the tension ties and compression struts impart a very high bending action on the shear-wall core. To help stiffen it, two other diaphragms were set in the mechanical space between the tenth and eleventh floors (see section on page 136) to couple the core to other stiffening elements in the structure—columns and beams.

The engineers discovered, after conducting a three-dimensional structural analysis, that the bending action on the core would eventually pull the structure out of plumb. Therefore, the building was built with a camber to compensate for the expected movement. Engineers made careful calculations for the precise placement of each floor to assure that the structure would eventually stand true. Measurements taken so far show the structure to be moving as predicted.

Of further note in this innovative structure (and unrelated to the cantilevering system) is the first-ever field application of 14,000-psi concrete. With the owner's permission and the architect's approval, a high-strength mixture was substituted in two test columns for the 9,000-psi concrete used elsewhere. Information on the concrete's behavior—including temperature, creep, and shrinkage—is provided by strain gauges in each of the columns. J.B.G.



Trusses spanning 174 ft for the ceiling of the 40,000-sq-ft trading floor bear on the 60- by 60-in. interior columns. Smaller 143-ft-long trusses for the upstairs trading room are suspended from hanger columns connected to the diaphragm walls. To help offset the bending action imposed on the shear-wall core by these trusses and the 30-story column load, two additional diaphragms couple the

core to other parts of the structure. In the photo at left, the main trading floor is enclosed. It abuts the partially framed south tower, which is flanked by five temporary stair towers to meet exiting requirements. Once the second tower is constructed around these stairs they will be removed.



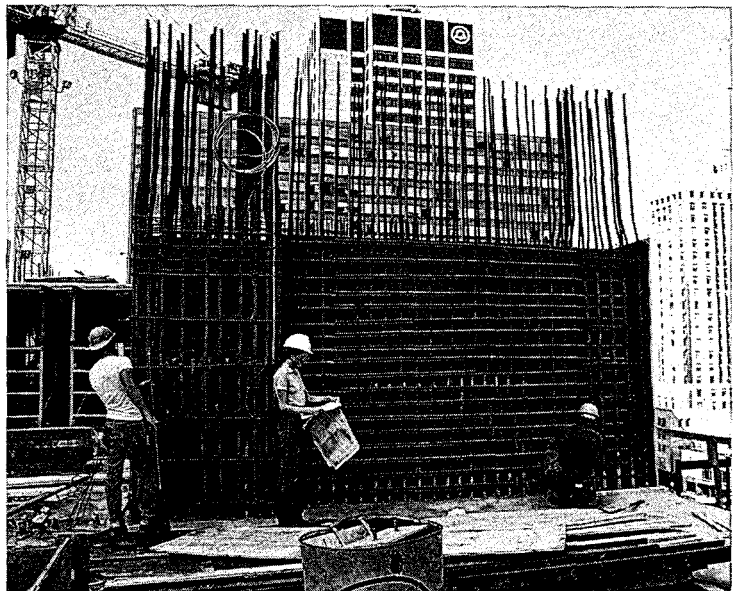
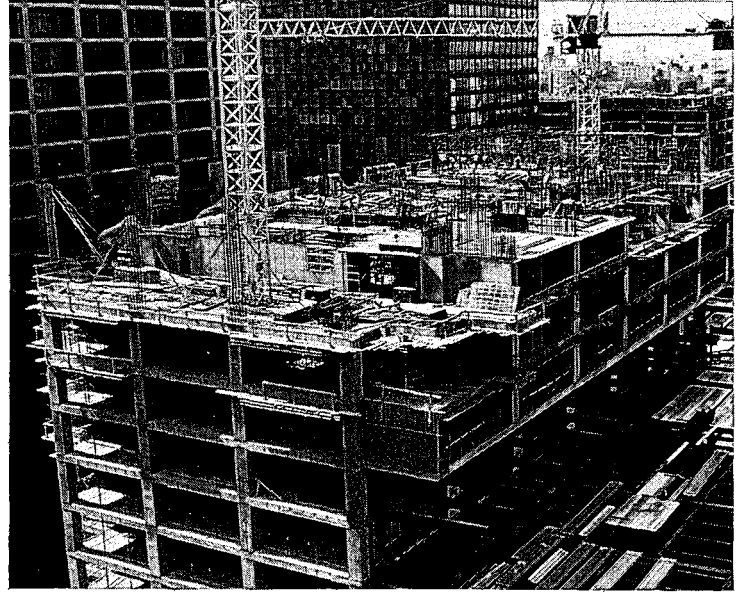
10 & 30 South Wacker Drive  
Chicago, Illinois

**Developers:**  
Metropolitan Structures; JMB  
Realty Corporation

**Architects:**  
Fujikawa Johnson and Associates,  
Inc.—Joseph Fujikawa, principal-  
in-charge; Gerald L. Johnson,  
project manager; Timothy J.  
Anderson, project architect

**Structural engineers:**  
Alfred Benesch & Company—  
Shankar Nair, chief structural  
engineer; Robert B. Johnson,  
project engineer  
**Concrete supplier:**  
Material Service Corporation

Robert B. Johnson photos



As constructed, the load transfer mechanism proved to be the most economical construction method involving the fewest architectural or functional penalties. Yet, its impact on the over-all structure did require some compensatory measures. Because of the significant bending action that the cantilevered towers imposed on the shear-wall core, the engineers had to deliberately camber the structure to compensate for expected horizontal deformation. Thus, each floor was built out of plumb to specifications the engineers calculated. To create a platform for placing the concrete diaphragm walls during construction,

structural steel "New York" frames were temporarily cantilevered off the tower (lower right in photo at top right). This permitted tower construction to proceed independently of the erection of the steel trusses spanning the trading floors—a requirement set in the project schedule. Shown in the photo, bottom right, is reinforcing steel for one of the diaphragm walls and a section of the dummy column.



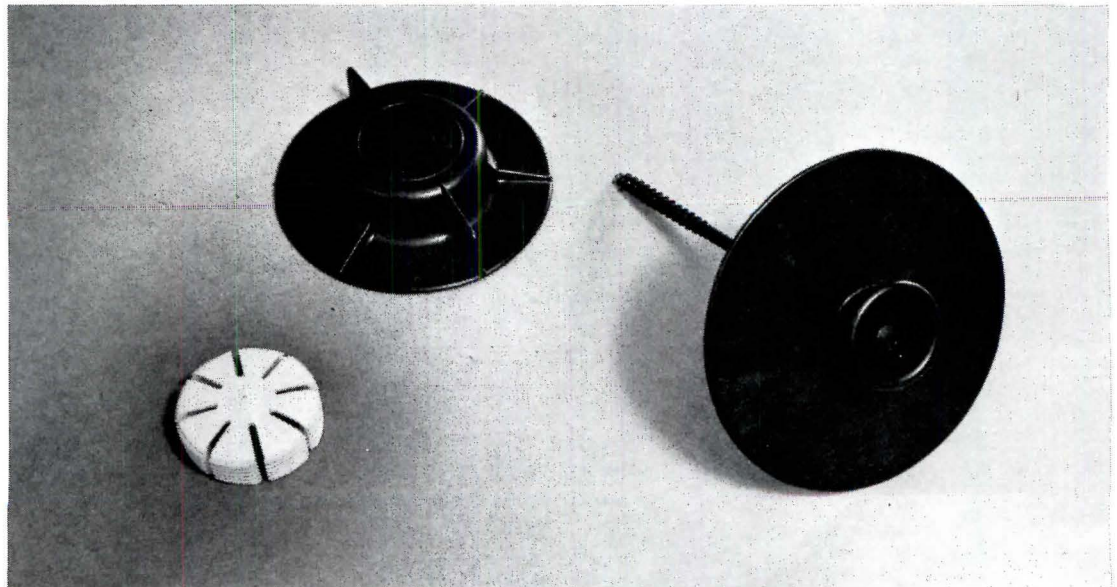
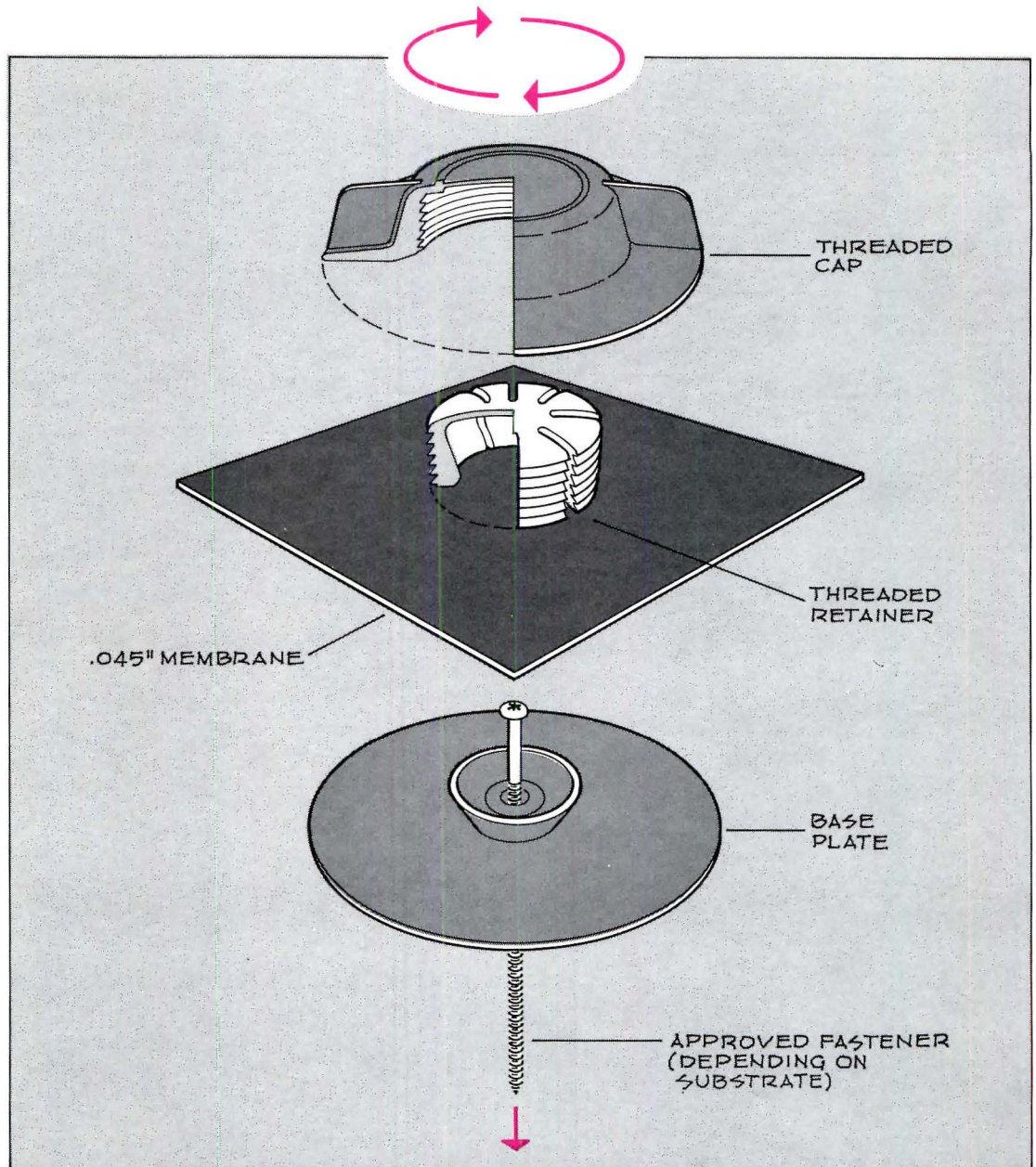
# New products

For more information, circle item numbers on Reader Service Card, pages 209-210

## Snap-on roofing

The United States roofing industry's first mechanically attached single-ply system that does not penetrate the membrane is sure to be the talk of the Midwest Roofing Contractors Association annual convention in Phoenix, where it makes its official debut this month. Called the *M.A.R.S. Design NP*, which stands for mechanically attached roofing system, nonpenetrating, it comprises three pieces of molded polyethylene—a knobbed base plate, a threaded white retainer and a threaded black cap. Contractors install the system by fastening the base plates to wood, concrete or metal decks on 3-ft centers using approved fasteners. Toggle fasteners are required for additional holding power in gypsum, Tectum and lightweight insulating concrete decks. After the membrane is spread over the base plates, retainer clips are snapped over the membrane onto the knobs of the base plates. Slots in these clips permit them to expand over and around the membrane; the threads mate with the top caps which, when hand tightened, pinch the membrane securely to the knobs on the base plates. Carlisle SynTec Systems, which bought exclusive rights to manufacture and market the design in the United States from a German company, points out that roofs installed using the *NP* system are lighter than ballasted single-ply designs and, because of reduced labor, less expensive than adhered systems—both of which it sells. Carlisle SynTec Systems, Division of Carlisle Corporation, Carlisle, Pa.

Circle 300 on reader service card



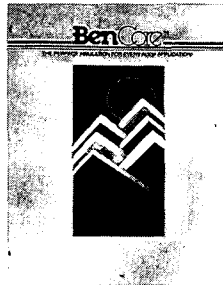


Quality-crafted  
Kramer refrigeration

the safeguard of  
flavor and freshness for  
foods and beverages - worldwide.

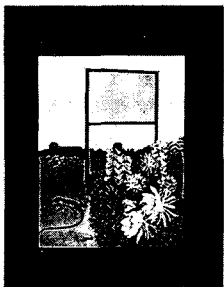
## Refrigeration systems

An 8-page color booklet describes a line of outdoor air-cooled refrigeration systems for commercial and industrial applications. Units range in size from 3/4 HP for walk-in coolers to 100 HP for food processing plants, warehouses, or distribution centers. Kramer Trenton Co., Trenton, N.J.  
*Circle 400 on reader service card*



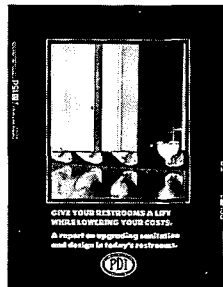
## Roof insulation

The *BenCore* line of thermal roofing insulation is featured in an 8-page color brochure. Graphics indicate which facing and core combinations to use with different roofing systems. Thermal and physical property charts are also included. Benoit, Inc., St. Paul, Minn.  
*Circle 406 on reader service card*



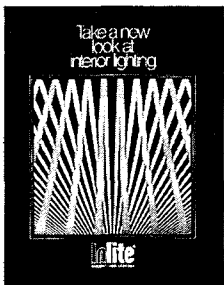
## Solar glazing

*Koolvue* is a bronze-tone energy-saving glass developed for residential application. A 4-page color brochure describes the product and outlines its heat-reflecting capabilities through a series of comparative performance and specification charts. AFG Industries, Inc., Kingsport, Tenn.  
*Circle 401 on reader service card*



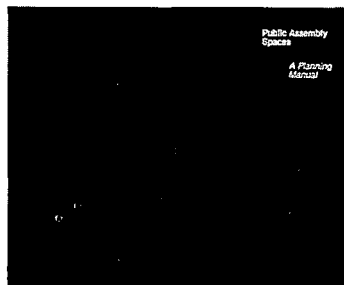
## Restroom fixtures

The trade association of plumbing equipment manufacturers has published a 12-page report on wall-mounted fixtures for restrooms in commercial buildings. Illustrations compare off-the-floor piping with conventional systems. Plumbing and Drainage Institute, Indianapolis, Ind.  
*Circle 407 on reader service card*



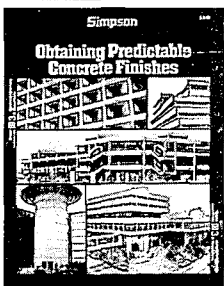
## Interior lighting

A 12-page color brochure describes the *Inlite* series of ambient and task lighting. Photographs depict sample installations, and an economic analysis shows the cost effectiveness of the HID lamp systems. Sterner Lighting Systems, Winsted, Minn.  
*Circle 402 on reader service card*



## Auditorium seating

This manufacturer of auditorium chairs has prepared a 40-page guide to the planning of assembly areas with fixed, self-rising seats. It addresses such topics as sight lines and codes and features a comparative analysis of 28 actual auditorium projects. JG Furniture Systems, Quakertown, Pa.  
*Circle 408 on reader service card*



## Concrete finishes

A 4-page color brochure and specification sheet outline *FormGuard* concrete finishing panels. In addition, the brochure addresses the problems encountered in obtaining predicted finishes. Simpson Timber Co., Seattle, Wash.  
*Circle 403 on reader service card*



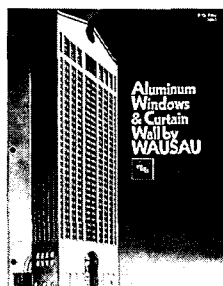
## CAD

The *Omnitech TM-1* is a computer-aided design and drafting system intended to assist architects and engineers in such areas as mapping, electrical wiring, mechanical functions, and interior space layout. A 4-page data sheet describes the system and its applications. Orange Systems, Rockville, Md.  
*Circle 409 on reader service card*



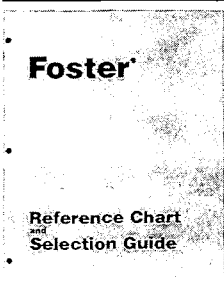
## Skylights

The energy-saving properties of skylights are described in an 8-page booklet. Charts report the results of thermal performance tests, and photographs illustrate typical installations. Wasco Products, Inc., Sanford, Maine.  
*Circle 404 on reader service card*



## Aluminum windows

A full line of aluminum windows and curtain walls, including a new security unit designed for detention and elderly-care facilities, is featured in a 20-page color booklet. Photographs illustrate sample installations and cross-sections. Wausau Metals Corp., Wausau, Wis.  
*Circle 410 on reader service card*



## Coatings and sealants

A line of asbestos-free mastics, coatings, sealants, and adhesives for use with thermal insulation systems is described in a 12-page booklet. Reference charts and a selection guide give details on each product. Foster Products, Houston, Texas.  
*Circle 405 on reader service card*



## Custom wood glazing

A 40-page color catalog illustrates this manufacturer's series of double- and triple-glazed pine windows and patio doors. Photographs show typical installations. Charts outline available sizes and configurations. Marvin Windows, Warroad, Minn.  
*Circle 411 on reader service card*  
*More literature on page 147*





# YOU'LL FIND GLIDDEN IN THE ROUGHEST PLACES.

GLID-GUARD® and ULTRA-HIDE® coatings helped the Lorain Historical Society turn this 73-year-old lighthouse into an impressive landmark in the Lorain, Ohio Harbor.

Glidden paint not only helped restore this historic building to its former condition, but will protect and keep it looking good for years to come. Even in the harsh environment of the Lake Erie shoreline.

## GLIDDEN HAS COATINGS TO PROTECT AND DECORATE A WORLD OF ENVIRONMENTS.

Silicones, epoxies, vinyls, alkyds, latexes, urethanes, bituminous coatings and mastics.

Come to Glidden one-stop Pro Shops for coatings that give you long-lasting protection. Look for us in Sweet's, or call John Ellis in Cleveland at 216/344-8207. You'll get the complete technical service backup you need for perfect performance.

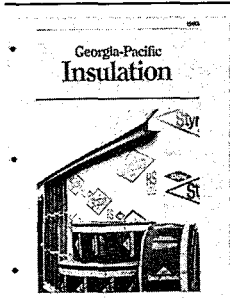
**Glidden** WHEN YOU MAKE A VERY GOOD PAINT, IT SHOWS.



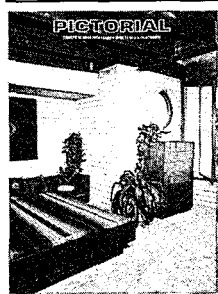
**SCM** GLIDDEN COATINGS & RESINS  
ARCHITECTURAL & MAINTENANCE  
SCM CORPORATION, CLEVELAND, OHIO 44115

Circle 64 on inquiry card

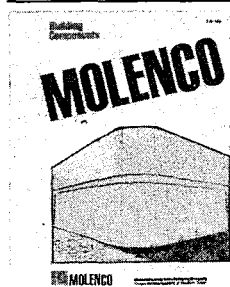




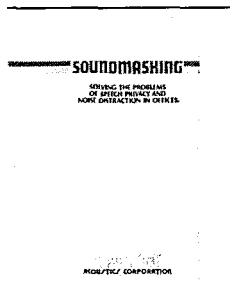
**Insulation**  
Foamboard sheathing and fiberglass insulation products are featured in a 4-page color catalog. In addition to property comparisons and product data, the literature includes a map that serves as a guide to insulation requirements around the nation. Georgia-Pacific Corp., Atlanta, Ga.  
*Circle 412 on reader service card*



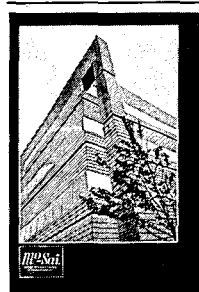
**Earth-sheltered structures**  
The national trade association for producers of concrete masonry has published a 12-page booklet that describes how the combination of earth sheltering and concrete can produce nearly stable year-round temperatures. Photographs depict seven actual case studies. National Concrete Masonry Assn., Herndon, Va.  
*Circle 413 on reader service card*



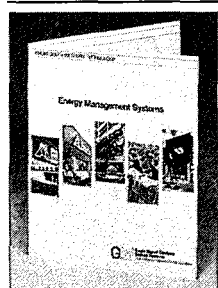
**Metal building components**  
A 16-page color pamphlet by this manufacturer of metal walls and roofs features *THERM-U-WALL*, a new foamed-in-place flat wall panel that combines high insulating properties with spanning capabilities. Color and specification charts are included. MOLENCO, Houston, Texas.  
*Circle 414 on reader service card*



**Sound masking**  
The effects of noise distraction on worker productivity and suggested remedies for improving office privacy are discussed in a 12-page booklet published by the manufacturer of SCAMP sound masking equipment. Photographs illustrate the product line. Insul-Art Corp., Belle Mead, N.J.  
*Circle 415 on reader service card*



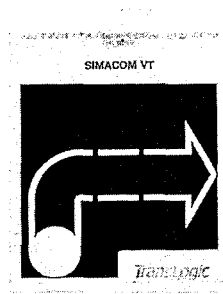
**Precast concrete**  
A 10-page color brochure produced by an association of eight manufacturers illustrates recent projects that utilize architectural precast concrete with exposed aggregate. Close-up photography reveals sample colors and textures. Mo-Sai Institute, Salt Lake City, Utah.  
*Circle 416 on reader service card*



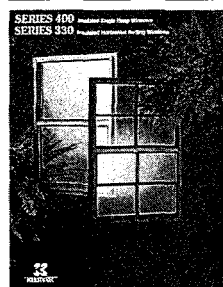
**Energy management system**  
A 4-page color brochure features the *EMS-100*, a microprocessor-based unit that controls the operation of energy-consuming equipment. The literature describes how remotely located units of the system can be monitored from one central computer. Eagle Signal Controls, Austin, Texas.  
*Circle 417 on reader service card*



**Heat-circulating fireplace**  
An electric masonry fireplace system is featured in a color brochure. The literature includes installation photographs, a list of design options and accessories, and diagrams illustrating measurements of the three heat-circulating models. Superior Fireplace Co., Fullerton, Calif.  
*Circle 418 on reader service card*



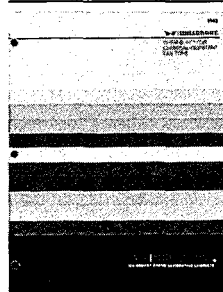
**Transport system**  
A 24-page manual outlines *Simacom VT*, a self-guided electric track system used for transporting loads up to 60 lb in standard or custom-designed cars. The system is designed for applications in factories, office buildings, laboratories, and health-care facilities. TransLogic Corp., Denver, Colo.  
*Circle 419 on reader service card*



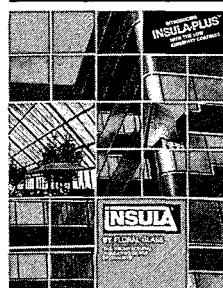
**Insulated windows**  
A 6-page color brochure illustrates the manufacturer's *Series 400* single-hung and *Series 330* horizontal rolling replacement window systems. The products are available in either double- or triple-glazed models. Krestmark Industries, Lewisville, Texas.  
*Circle 420 on reader service card*



**Furniture systems**  
A 4-page color brochure illustrates a line of office systems furniture consisting of posts, panels, work stations, and storage modules. Two groups of seating units and components for the electronic office are also featured. Westinghouse Furniture Systems, Grand Rapids, Mich.  
*Circle 421 on reader service card*



**Chemical-resistant laminate**  
A 4-page pamphlet outlines the color options and physical properties of *Chem-Surf*, a laminate designed for use in chemical, medical, and photographic laboratories. A list of chemicals resisted by the product is included. Wilsonart, Temple, Texas.  
*Circle 422 on reader service card*



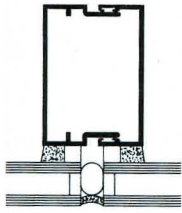
**Insulating glass**  
*INSULA* and *INSULA-PLUS* double-sealed insulating glass products are described and illustrated in an 8-page color brochure. The literature includes typical performance properties and product specifications. Floral Insulating Glass Products, Hauppauge, N.Y.  
*Circle 423 on reader service card*  
*More literature on page 161*



Design View by Kawneer.

# Less of the metal. More of the performance.

The flush-grid look. There is more to it than mere eye appeal. Because, even when aesthetic requirements are great, there still can be no substitutes for engineering integrity and performance assurance.



The Kawneer Design View framing system offers designers the opportunity to create the clear and seemingly unbroken

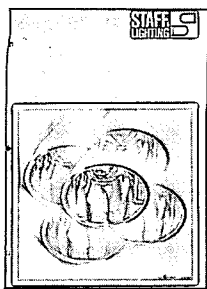
expanses of glass which are so visually appealing.

Design View achieves its beauty with a unitized pre-glazed system which eliminates the need for metal covers between lites of 1/4" to 1" insulating glass. Design View features better engineering, such as head and sill glass retention, expansion-contraction between units, and performance testing results which prove its ability to

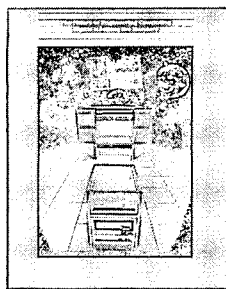


\*Test results available on request.

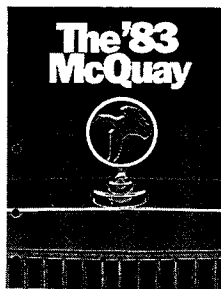




**Lighting**  
**SPEC-2** is a new series of open reflector, recessed fixtures available in downlight or wall wash trims. A 16-page color catalog describes and illustrates the line—which accommodates a variety of fluorescent, mercury vapor, incandescent, and high-pressure sodium lamps—and features the **ESD** energy-efficient fluorescent unit. Staff Lighting Corp., Highland, N.Y.  
 Circle 424 on reader service card



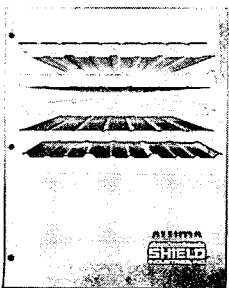
**CAD**  
 A 16-page color brochure outlines the manufacturer's line of **VAX** computer systems for architects and engineers. Featured sections on architectural design and mechanical, electrical, and civil engineering review system capabilities and suggested applications. Digital Equipment Corp., Marlboro, Mass.  
 Circle 427 on reader service card



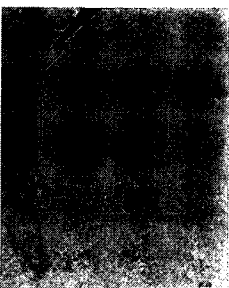
**Heat transfer products**  
 A complete line of hvac units for commercial use is described and illustrated in a 16-page brochure. Included in the literature is the new **SEASONAIRE** water source heat pump available in either horizontal or vertical models. McQuay-Perflex Inc., Minneapolis, Minn.  
 Circle 428 on reader service card



**Access flooring**  
 A 6-page color brochure features welded steel composite-core floor panels designed for access to computer systems. Photographs display the manufacturer's product line in a variety of practical applications. C-Tec, Inc., Grand Rapids, Mich.  
 Circle 429 on reader service card  
 Continued on page 163



**Insulated panels and doors**  
 A 6-page brochure describes prefabricated wall and roof panels insulated with foamed-in-place urethane for industrial and cold-storage buildings. Information is also included on the manufacturer's **Hercules** line of insulated doors available for manual, electric, or hydraulic operation. Aluma Shield Industries, Inc., Daytona Beach, Fla.  
 Circle 425 on reader service card



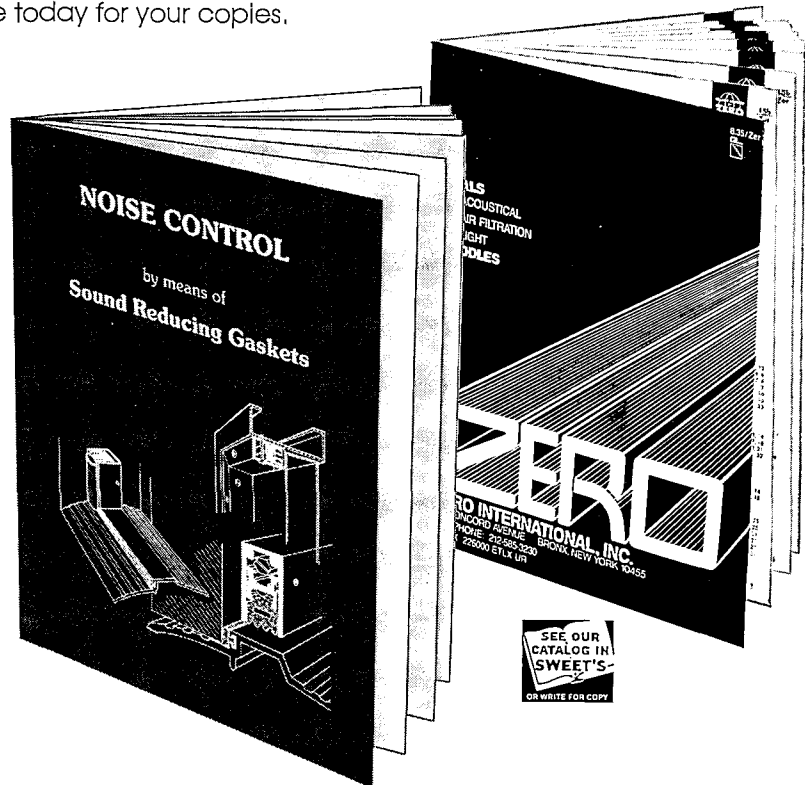
**Lightning protection systems**  
 A 24-page illustrated guide outlines a step-by-step inspection program for concealed and nonconcealed lightning protection systems in commercial and industrial buildings. The literature includes an 8-page inspection report for use by project engineers and on-site inspectors. Lightning Protection Institute, Harvard, Ill.  
 Circle 426 on reader service card

# 2 new catalogs now ready!

**16-page Noise Control Guide.** All you need to know about STC ratings, decibels, frequencies—and many other sometimes confusing terms.

**28-page Product Catalog.** 198 drawings, in full-scale, of weather, light and sound seals, plus thresholds.

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1924-1984...60 years of opening the door to progress.

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# Noramment Duo® Flooring Only Your Imagination Limits The Possibilities.

Now there is a 100% synthetic rubber flooring every bit as striking as the interior you create. Available in five rich color combinations, Noramment Duo's beauty is long-wearing and continuously self-waxing.

Function with Beauty... Only from Nora Flooring.

For more information on Noramment Duo and other Nora Flooring products, write: Nora Flooring, 4201 Wilson Avenue, Madison, Indiana 47250. (812) 273-1852.

Sweets BUYLINE® (800) 447-1982.

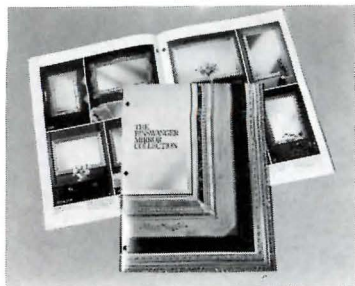


A Freudenberg Company

© Nora Flooring 1982

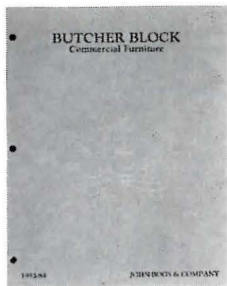
Circle 77 on inquiry card





**Mirrors**

Photographs of products and sample room installations illustrate a 66-page color catalog of this manufacturer's line of mirrors. New items featured include the Philadelphia Collection of traditional mirrors in cherry finishes, a group of contemporary mirrors with colored frames, and a series of mirrored furniture. Binswanger Mirror Products, Memphis, Tenn. Circle 430 on reader service card



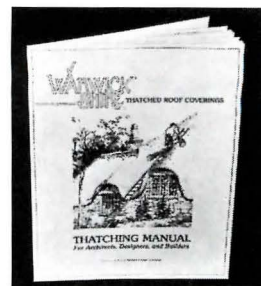
**Butcher block furniture**

A 12-page color catalog outlines butcher block furniture for commercial use. Products include tables, tops, bases, chairs, and bar surfaces made from northern hard rock maple and Appalachian red oak. Photographs depict sample installations. John Boos & Co., Effingham, Ill. Circle 433 on reader service card



**Wiring devices**

The *Sierraplex* series of rocker switches, receptacles, and ground fault circuit interrupters for commercial, institutional, and residential application is described in a 12-page booklet. Photographs show sample installations. Charts outline product specifications. Pass & Seymour, Syracuse, N.Y. Circle 434 on reader service card



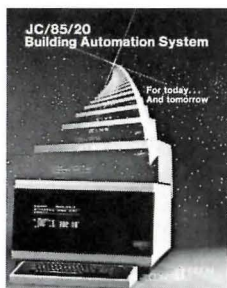
**Thatching**

This supplier and installer of water reed thatched roofs has published a 24-page manual on the craft of thatching and its applications. Photographs and illustrations depict cutaway views, architectural details, and sections. Warwick Cottage Enterprises, Costa Mesa, Calif. Circle 435 on reader service card Continued on page 165



**Carpet directory**

The national association of wool carpeting manufacturers has prepared a 60-page specification guide and resource directory. The publication lists wool carpet lines from 55 domestic makers, 60 importers, and 62 custom resources. Charts include information on fiber content, construction, and coloration. The Wool Bureau, Atlanta, Ga. Circle 431 on reader service card



**Building monitor**

A 12-page color brochure describes the *JC/85-20*, a computerized control system for small buildings. Photographs and text illustrate how the expandable system monitors energy, fire, and security from one centralized computer. Johnson Controls, Milwaukee, Wis. Circle 432 on reader service card

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## A MAJOR DEVELOPMENT OF KALWALL®

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UNLIMITED DIAMETERS; MANUFACTURED TO YOUR DESIGN. DESIGN/DETAILING/ENGINEERING ASSISTANCE IS AVAILABLE. TO ARRANGE A PERSONAL PRODUCT PRESENTATION, CALL.

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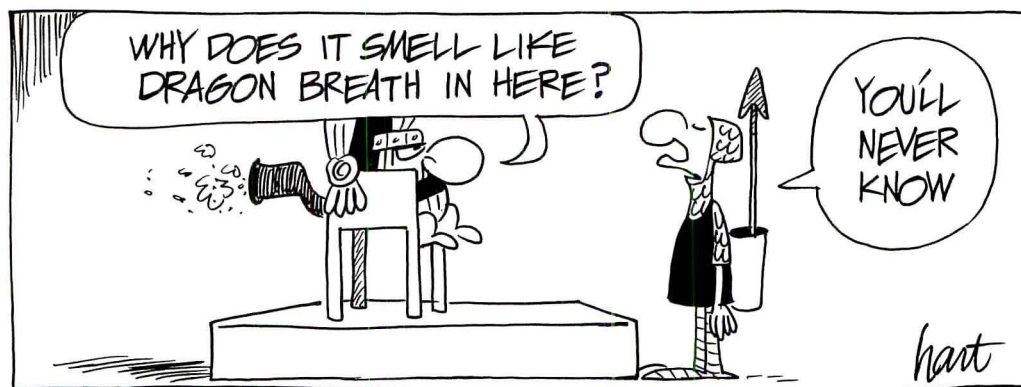
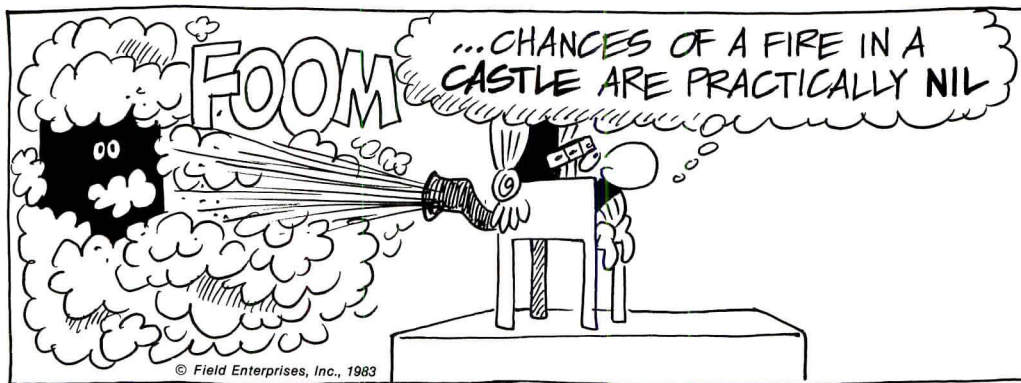
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PATENTS PENDING

Robert Magensell Jones & Associates, Architect



# Last year our fire protection systems kept the heat off a lot of business owners.



It's sheer wizardry the way Fenwal's suppression systems spot fire and snuff it out instantly. Our systems use the fastest way known of stopping fire, Halon 1301. It's perfectly clean and people-safe. That keeps downtime to an absolute minimum.

We've been building and perfecting our systems for more than 20 years. There are thousands installed around the world. Because Fenwal manufactures all its own major system components, you get a system with components built to work together and backed by single source responsibility.

# FENWAL®

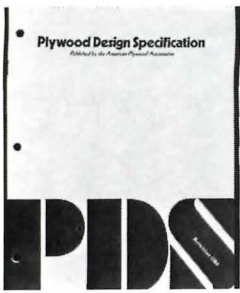
Plus the attention of a *local* factory trained wizard who's knowledgeable in cost efficient system configuration.

Whatever you want to protect—valuable documents, computer rooms, communication centers, control rooms, switching rooms, anything at all that you can't afford to be without—we can do the job.

For the name of your local Fenwal wizard, look in the Yellow Pages under "Fire Protection," or contact the Castle at (617) 881-2000. Fenwal Incorporated, Ashland, MA 01721. A Division of Kidde, Inc.

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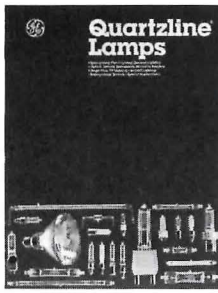




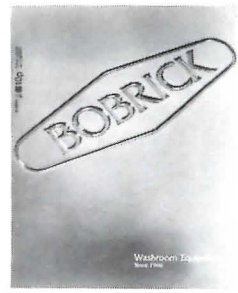
**Plywood**  
A 32-page manual published by the national trade association of plywood manufacturers features section properties, recommended design stresses, and design methods in accordance with standards set by the U.S. Department of Commerce. A glossary of terms is included. American Plywood Association, Tacoma, Wash.  
Circle 436 on reader service card



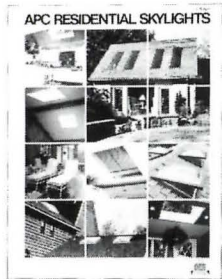
**Roof maintenance**  
A 12-page color brochure presents a data-acquisition system for standardizing roof maintenance needs. The computer-generated program is designed to provide management with information needed to make correct decisions regarding roof maintenance and repair. Tremco, Cleveland, Ohio.  
Circle 439 on reader service card



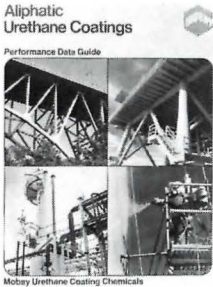
**Quartz lamps**  
A 6-page data sheet gives specifications of the *Watt-Miser Quartzline* series of tungsten-halogen lamps. The new lamp is said to save 40 per cent in energy costs while providing the same life and nearly the equivalent light output as a standard 1500W lamp. General Electric, Cleveland, Ohio.  
Circle 440 on reader service card



**Washroom equipment**  
A 56-page catalog describes the manufacturer's current line of washroom fixtures. Featured are the *1050* series of vanity centers designed to accommodate those in wheelchairs and a new group of *Slimline* soap dispensers with noncorrodible valves. Bobrick International, North Hollywood, Calif.  
Circle 441 on reader service card



**Skylights**  
Residential and light commercial skylights are described and illustrated in a 4-page color brochure. Featured products include *Long-Lites*, which fit between beams of a house without cutting rafters; *Sky-View* fixed and venting flat skylights; and *Skyblind* light- and heat-control units. APC Corp., Hawthorne, N.J.  
Circle 437 on reader service card



**Urethane coatings**  
A 12-page color brochure outlines the performance characteristics of acrylic and polyester aliphatic urethane coatings and offers guidelines for selecting the appropriate system to meet specific environmental and performance requirements. Charts give comparative data; photographs illustrate sample applications. Mobay Chemical Corp., Pittsburgh, Pa.  
Circle 438 on reader service card

# SCRATCH N' SCUFF

It won't show on Roppe cove base. Made of flexible extruded rubber, the exclusive, satin finish resists scuffing, gouging, burns and chemicals. Cleans up with soap and water. Easy to install, Roppe cove base won't shrink, with maximum stability and fit for lasting attractive appearance. In 22 beautiful accent colors with matching molded corners. For your nearest distributor, write Roppe Rubber Corporation, 1602 N. Union Street, Box X, Fostoria, Ohio 44830. Or call toll-free.

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# DRYVIT®. HOW THE TRUST WAS EARNED.

## We believe in quality.

When we introduced the concept of an exterior insulation and finish system to the United States in 1969, we had to prove the System could perform better than traditional materials.

And so our commitment to stringent testing and quality control was born.

## We began with a proven formula for our Finish coat and cementitious adhesive.

We know there is no substitute for the performance level of a 100% pure acrylic co-polymer product.

Valuable properties such as flexibility, fade-resistance, alkali-stability, moisture-resistance and wet adhesion are lost when substitutes are added.

And add to this, our special impact system, Panzer® Mesh, and you have all the ingredients for a building that will live up to the high standard you set.



## We offer technical support in the field and at the planning stage.

Design assistance is available from our technical staff.

And for fast local assistance, our distributors are nearby and always available.

You can trust the Dryvit Difference to come through when you need it.

## Demanding fire and structural testing goes beyond code minimums.

The Dryvit System is recognized by all three model code agencies: ICBO, BOCA, SBCCI.

We've subjected our System further, to Full Scale Fire Tests with 1500 and 1250 pound fire sources as well as the Factory Mutual Corner Test.

Positive and negative wind load testing has been conducted on full scale wall assemblies in accordance with ASTM E330 procedures.

Dryvit performs even under demanding conditions.



## Dryvit retrofit gives office building a fashionable Art Deco facade.

5500 Yale Street, Englewood, Colorado, was a precast concrete eyesore before architects Ginsler and Associates designed this retrofit. Taking advantage of

Dryvit's design flexibility and the expertise of the applicator, they were able to incorporate aesthetic relief. Bands of 1½" x 7" Dryvit Insulation Board create flowing lines, adding drama to the balconies.



## Face-saving retrofit adds insulation to St. Paul's Housing for the Elderly.

Detroit, Michigan, winters had taken their toll of this 12-story uninsulated building.

Smith Associates, Inc., the architects, chose Dryvit Outsulation to solve their problems. In addition to adding needed insulation, the Dryvit retrofit provided an attractive weather-resistant surface. Occupants now enjoy a better level of comfort while the building's appearance upgrades the entire area.

## Gardner Student Center serves as entrance gate to the University of Akron, Ohio.

Believe it or not, a road goes through this building. Karl R. Roher & Associates, architects, turned to Dryvit to accomplish the archways and soffits their design required. Dryvit's impact system, employing Panzer® Mesh, was used in high traffic areas. Also gained: a cost-effective, energy-efficient building that blends beautifully with the campus.

## Over 40,000 buildings stand as proof of our performance.

Over 30 years of Dryvit experience in this country and Europe offer peace of mind to the developer and architect specifying Dryvit.

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It's the Dryvit Difference.

**OUTSULATION®**

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From rebar to remesh. The next time you think of metal products, think of Georgia-Pacific.



When it's time to think about quality metal products, think about the leading name in the building products industry. Think Georgia-Pacific.

We've got rebar, remesh, drywall screws, siding, roofing and one of the largest selections of nails in the country.

And our worldwide supply network gives us a competitive edge — so you get a competitive price.

We're Georgia-Pacific. And when it comes to building materials, we've got everything from wood to metal products. Because that's what it takes.

**We've got what it takes to lead the way.**

**Georgia-Pacific**







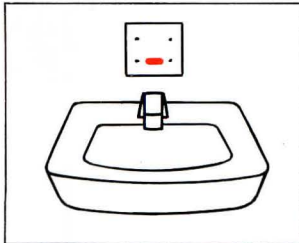
T.M.

# Sloan presents the no-hands lavatory.

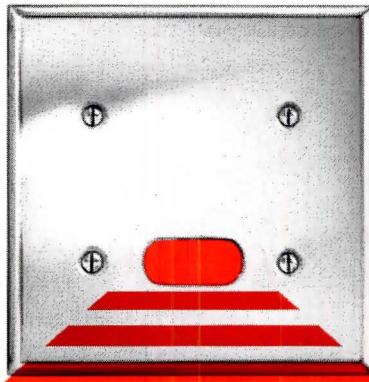
Take the operation of the lavatory *out* of people's hands, and it becomes a cleaner, more cost-efficient fixture.

That's the big idea from Sloan—the no-hands lavatory, with no handles to turn on, no handles to forget to turn off. The Sloan Optima™ electronic sensor is in charge.

When the user approaches the lavatory, he breaks an invisible beam of light generated by the Optima sensor. This opens a solenoid valve and water flows from the faucet automatically. When the user steps away, the water shuts off.



With no-hands lavatories, bacterial contamination is reduced. There's less clean-



ing, with no handles to get dirty and less chance of sink-top mess. There's less water waste, because water flows only when needed and the user can't forget to turn the water off. Using less water, of course, also means saving on energy used to pump and heat

that water. There's also less maintenance—reliability is built in. And there's far less chance of misuse or abuse.

No-hands operation easily adapts to the rest of the restroom—toilets *and* urinals. And even to soap dispensers, hand dryers, and more. With Optima systems everywhere, you get optimum savings and optimum sanitation.

Ask your Sloan representative about Optima systems today. Or write us.



**SLOAN VALVE COMPANY**  
10500 Seymour Avenue, Franklin Park, IL 60131

Circle 123 on inquiry card